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The China Medical Missionary Journal.

Contents of No. 1., March, 1897.

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The China Medical Missionary Journal.

VOL. XI.

MARCH, 1897.

No. 1.

Original Communications.

[No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editor on the first day of the month preceding that in which they are expected to appear. The editor cannot undertake to return manuscripts which are sent to him. A complimentary edition of a dozen reprints of his article will be furnished each contributor. Any number of reprints may be had at reasonable rates if a *written* order for the same accompany the paper.]

PRESIDENT'S ADDRESS.

To the Members of the China Medical Missionary Association.

DEAR BRETHREN:

It was a very great surprise to learn of the honor which you have seen fit to confer upon me. I have never coveted such a position, and feel unworthy of it. But as such has been your pleasure I feel under special obligations to the Association, and will endeavor to do all I can to help advance its interests.

The need and usefulness of such an Association I had in mind for some seven years before it was finally organized, and since then it has been my fixed purpose to aid it in every possible way. Its ten years' history fully justifies its organization and continued existence. Notwithstanding the many obstacles with which we have had to contend we have been able, with capable and earnest men at the head and the aid of its many members, to steadily advance along the lines proposed in our Constitution, and have won the recognition, respect and appreciation of physicians and medical and missionary societies in other countries as well as in China.

With these proofs of the need and utility of our Association we may well have courage to go forward and take up the duties and problems that now confront us. It is not my purpose to enlarge upon them in an address of this kind, but it is proper to briefly refer to some of them by way of emphasis and to remind ourselves of what still needs to be done. And, first, it is to be hoped that all the members will take interest enough in the seven motions presented in the December No. of the Journal to vote upon them, and as far as possible, in the affirmative, in order to facilitate the operations of the Association.

A second pressing duty is the early preparation or completion of a medical Anglo-Chinese Dictionary. The advance of medical science in Chinese will be greatly hindered till this is accomplished, and it may not be apparent to many of the members how much depends upon the completion of this work. Many of you perhaps know that there is a strong desire on the part of some to make radical changes, at this time, in nearly all departments of medical nomenclature, and the work of such changes has already begun, so that no medical work in Chinese, now in progress, should be finished until some standard list of terms can be settled upon. And as our Association has taken up the work of furnishing a Medical Dictionary we should see to it that the work is accomplished at an early date.

The next thing I would refer to is the need of an illustrated medical journal in Chinese. I believe I was the first to call attention to this subject some eight years ago. Eight years previous to that Dr. Kerr had started a small medical quarterly, but for various reasons, was not able to continue it long. The large number that have since gone out from the numerous missionary hospitals in China, and the increasing demand for such a journal, are sufficient reasons for a renewal of the subject, and it is gratifying to know that Dr. Cousland has been interesting himself in the matter the past year and has made some progress, but he needs our sympathy, interest and help if we would see it accomplished.

Another very important duty resting upon us all is to do our part in helping to sustain our Journal and continue to make it what it was intended to be, a valuable *medical* and *missionary* journal. I notice that of about three hundred and fifteen articles, written by one hundred and thirteen authors for the ten volumes of our Journal, one hundred and twenty-seven of them, or more than one-third were written by eight persons, and more than two-thirds of all the articles were written by thirty-four writers. Or in other words, eight persons contributed more than one-third, twenty-six the second third and seventy-nine the other third. This will be seen to be out of all proper proportion to our membership and ability. It has been stated several times, and I wish to lay emphasis upon it once more, that the greatest burden of this Association rests upon the chief Editor of the Journal, and it should be remembered that medical missionaries are exceedingly busy people, and can give but comparatively little time to this kind of work. Hence the necessity of each one doing his share.

Then, too, we need a broader representation in the Journal. China is a large country, and varies a good deal from North to South and East to West. We need to hear from all parts of the empire and thus become of mutual aid as well as keeping in touch and sympathy with each other. Other countries are also becoming more and more interested in us, our work and the condition of medical science and medical missionary work in China. The education of

Chinese medical students to supply the varied needs of this great country, is also one of the main objects of our work in China, and it should occupy a prominent place in our thoughts, plans and efforts for the good of this people. We should endeavor, first, to select the best material China affords and then utilize every available means to prepare men and women, the most efficient possible, for the responsible work in which they are to engage. This suggests, also, the need of preparing more medical books and revising those already in use, in order to meet the rapidly increasing demands of the medical students and graduates of the numerous hospitals already scattered over the country. The purpose of China to improve her army and navy and standard of education and open up the country with railroads, etc., will create a corresponding demand for well-educated physicians; and herein is indicated our duty as an Association. Because, while China has begun to change, the transition must of necessity be slow, and none are so well suited as medical missionaries to help supply these varied needs. I have thus briefly referred to some of the things that need our immediate attention. It will probably require many articles from different writers to give proper emphasis and the necessary impulse to action. But it is hoped that each one will feel that the continued success of the Association depends upon his proportionate effort, and that he is in duty bound as a member to contribute his share.

Let us all seek to fulfill the duties of the hour during another *biennium*, as an encouragement to those whom you have chosen especially to look after the work, as a duty to the Association and medical science, and as a duty to Christianity, without which all of our other labors would be of no lasting good. The possibility of a long and useful mission, lies yet before us, and it is for us to determine, to a large extent, the measure of its successes.

In conclusion, I think you will all unite in giving a hearty vote of thanks to all of the retiring officers and a double vote to the Editor who has served us so faithfully and well and has kept up the reputation of the journal, both in style and quality of matter. I think that thanks are also due to all those who have contributed to the Journal, both for past services and as an encouragement to do more in the future. And also to any who have aided the Association in any way.

Let it be remembered, also, that we desire physicians not connected with the Association, whether medical missionaries or not, and any others, to feel free to contribute to the different departments of the Journal anything consistent with the purpose of the Association, and to co-operate with us in any way to help further its interests.

Pagoda Anchorage, February 20th, 1897.

H. T. WHITNEY.

PERIPLEURITIC ABSCESS.

By DUGALD CHRISTIE,

Moukden Hospital, Manchuria.

There is a form of suppurative inflammation of the thoracic wall which is not infrequently met with here. The disease is not mentioned in any text-book I have seen, but there is an article on the subject in the *British Medical Journal* of February, 1893, in which it is described as a complaint of great rarity. The majority of the cases which have come under observation here were seen after the acute stage had passed and the abscesses had already formed, but the account given by the patients of the earlier stages of the disease indicates severe constitutional disturbance.

The clinical history is briefly as follows: The first symptom of the attack is, in each case, sudden chilliness, quickly followed by high fever. On the second or third day severe pain develops on one side of the chest, more commonly the left. Over a large area the skin becomes red and the tissues swollen, the slightest movement of the body or arm causing great pain. These symptoms increase in severity till an abscess is formed, and only subside when it bursts, which usually takes place about ten days after the beginning of the attack. In none of the cases seen by me was there any lung trouble or indication of pleurisy. In a few there was a history of overstrain, caused by carrying heavy loads on a bamboo pole placed across the shoulder; but, in the majority, injury, strain and pulmonary symptoms are conspicuous by their absence.

Three cases have been recently under treatment in the Moukden Hospital, whose history corresponds with the above. When admitted, the abscesses had already burst. In all of them the opening was situated a little below and two inches to the inside of the nipple, with sinuses leading underneath the muscles. About a third of the lower part of the chest on the affected side was red, œdematous, and very tender to pressure. Percussion and auscultation revealed nothing abnormal, and the axillary glands were not affected. In the last case the temperature on admission was 101° F. and the pulse 120.

The treatment is simple and quite satisfactory in its results. The abscess cavity and sinuses are laid freely open, explored with the finger, thoroughly washed with an antiseptic solution and drained. Sometimes unhealthy granulations have to be removed with a Volkmann's spoon.

The etiology of the disease seems to me most obscure. The condition is evidently not secondary to any inflammatory or suppurative action in the pleura, nor have I detected disease of the ribs in any instance. Unfortunate-

ly we have been unable to watch any cases from the commencement, and the majority come under treatment after the abscesses have burst and the condition is aggravated by the application of irritating native plasters. My own opinion is that, although the patients do not themselves attribute the disease to strain, the carrying of heavy loads suspended to the bamboo pole, already referred to, has a large share in its causation. All the cases I have seen were men of the working class, and this is the universal method in Manchuria of carrying heavy burdens.



ATRESIA ANI.

By DUGALD CHRISTIE.

Moukden, Manchuria.

The following case is interesting as showing the possibility of a child living and even thriving in spite of a serious congenital malformation, and is, I think, worthy of special note in view of the exceptional minuteness of the fistulous opening.

The patient was a girl three years of age. Nothing had been noticed at birth, except that the child cried incessantly, and that no meconium was passed until the third day, when the deformity was observed for the first time. When admitted to the hospital I found the abdomen tumid, hard, and at some points tender; but otherwise the child was well developed, and apparently in good health. There was no trace of an anus, but a communication existed between the rectum and the genital tract. The opening, which was situated in the posterior commissure of the vagina, was very small, and when fully stretched only measured $\frac{1}{8}$ of an inch in diameter. A bent probe was passed through this opening into the rectum, and it was found that there was considerable thickness of tissue between the end of the bowel and the external surface.

The child having been placed in the lithotomy position and chloroform administered I made an incision in the median line backwards, and by careful dissection the rectum was exposed. On opening it a large quantity of fæces escaped. The bowel was then drawn down and secured by sutures to the skin. The edges of the vaginal opening were pared and carefully united. The new anus was kept freely open, and, although for some days there was a slight fæcal discharge by the vagina it speedily diminished in quantity. The child's mother was called home before the cure was complete, but the patient left us on a fair way to perfect recovery.

WISDOM TEETH.

By ROBERT S. IVY, D.D.S.

In your issue (March and June Nos. p. 18) I notice some remarks by Dr. Walton on wisdom teeth. To a certain extent I can endorse from my own observations what is there stated as to the irregularity of appearance and tendency to decay "as in the case of other races." The reasons for this are not far to seek. Wisdom teeth, developing as they do, when the other teeth are already in position and fully formed, are deficient in the amount of that inorganic material which is essential to resist the wear and tear of mechanical force. Their whole structure, compared with neighbouring teeth, is soft and lacking in resistive power. Another predisposing cause (referred to by Garretson) of caries in wisdom teeth, especially those in the lower jaw, is their painful and slow process of eruption; in some cases there remains absolutely no space in which they can make their appearance, hence not only is a chronic morbidity established, but the face of the tooth is overlaid by the gum and a receptacle is formed, which being constantly filled with food, etc., causes the tooth to decay. From my own observation I should say that wisdom teeth are more constant in appearance, more normal in shape and less predisposed to decay in the Chinese than in the foreigner. Out of fifty natives, varying in age from eighteen to forty, I found twelve who had never developed any wisdom teeth; thirty-four having these organs fully developed, undecayed and of good structure, and four having lost them. Taking the same number of foreigners, Europeans and Americans about the same ages, I found eighteen in whom they had never erupted, twenty-three had already had them operated on by a dentist, either filled or extracted, the remainder (nine) had them fully developed and in good condition.

The increasing contraction of the jaws in the higher civilized races is doubtless a factor in the gradual suppression of the wisdom teeth, for all anthropologists have observed that the jaw of animals is larger in proportion to the cranium than that of man, and the jaw of savage races is larger than that of civilized races. With increase in the capacity of the brain case there seems to be a decrease in the size of the maxilla. The substitution of food which requires but little exercise and power of the muscles of mastication will in a long series of generations at least diminish the size of the jaws. This evolution of food is now going on, with regard to the race, without regard to the intellectual development of the individual. But the cause of

the degeneracy of the wisdom teeth and maxilla is found in their disuse. This cause has been transmitted with increasing force to succeeding generations, for it is a recognized fact that the posterior dental portion of the jaws is always shortened in civilized races, which shortening may be attributed to civilized mankind habitually feeding on soft, cooked food, and thus using the jaw less.



FLANNEL BANDAGING FOR LEG ULCERS.

BY J. R. WILKINSON, M.D., SOOCHOW.

In calling attention to this mode of treating leg ulcers I will say that the material was first brought to my notice by McBurney, of New York. I prepare the bandage in the following manner. Select flannel as free from cotton as possible; then take one corner of the end and bring it across the width of the cloth until it comes exactly even with the opposite side, thus making a right angle to the body of cloth. Press the bias fold and with a pair of scissors cut the cloth along this fold into strips of the required width. This gives the full elastic effect of the flannel, which is important. I have found by experience that four inches is the best width; since after the bandage has been washed several times it shrinks. Special care has to be taken to keep the cloth on the angle gotten by the above method, for the nearer across the flannel the bandage is cut the less elastic and more useless it is. The bandage is to be put together by laying one edge flat on the other and stitching carefully, so as to make it as smooth as possible. I find it more convenient to make it up in long pieces. Then when using it on any given case I can easily cut it off, after having bandaged properly and allowing for the shrinkage which follows washing.

The greatest care has to be observed in washing the flannel. The temperature of the water ought to be the same throughout the washing, not allowing the cloth to become chilled in changing the water. Good soap and soft rain water is best, and it should be washed in changes of quite warm water and soap, until all the spots are washed out. Then wring as dry as possible, not to injure the cloth, and before hanging out to dry take the bandage in the hands and stretch it as wide as possible throughout its whole length. When dried, after having been thus stretched, it preserves nearly all of its original elasticity. This bandage does not interfere with any of the various applications which we may find necessary to make from day to day.

I usually wait a few days after a new patient comes before using the flannel ; first, to see if he intends coming on, and is in earnest ; and second, to get rid of the worst of the odor and filth with hot water and soap. In this way I lose very few bandages by patients coming a time or two and then not returning.

The patients that I find most helped by this form of bandaging are :— first, those of long standing ulcers with all the tissues swollen and engorged and the old granulations, where there are any, œdematous ; second, those whose veins are weak and giving way by the long strain on them, and those whose veins have gone a step further and have reached a varicose condition ; third, those cases of from three to any number of years standing where the base of the ulcer is very much lower than the surrounding skin, (for such ulcers will never heal until the skin and base of ulcer have gotten again on the same plane), very hard and rather cicatricial ; fourth, those cases where the base of the ulcer has become so hypertrophied that it stands entirely above the level of the surrounding skin (unless they are small and nodular, in which case I usually put a piece of zinc cut, so that when placed under the bandage the pressure will be directly upon the nodule).

I find that the more I practice putting on those bandages the more effectual they are. In putting them on I draw them steadily and as tight as the patient can well bear. It is always better to begin with the first turn below the ankle and give the ankle a good firm support. Just *above* the ankle one should be careful not to draw the bandage *too* tight, but as you get higher and higher along the belly of the muscles of the calf you can put on considerable force until you get beyond the calf, then *very* gradually lessen the tension until you are ready to put in the pins. I have learned never to change the tension of the bandage abruptly, for in so doing one aggravates the very conditions that one hopes by its use to remedy.

The bandage is warm in winter, and in summer it admits of free ventilation, and the patient does not complain of the heat after the first day or two. It is elastic, and the patient's muscles have easy play in walking, thus permitting easy and rapid return of venous blood. By using some judgment and care in selecting cases, and by attending to the washing of the bandages oneself, the expense will be found to be inconsiderable. I have bought all wool flannel at Shanghai at from 30 c. to 50 c. per yard.

NON-MALARIAL REMITTENT FEVER AND ITS HÆMATOZOON.

By E. W. VON TUNZELMANN, *M.B., Lon., M.R.C.S., Eng.*

Since about the middle of 1896 there have occurred in Chefoo a number of cases of a fever hitherto unknown to me, and, I believe, as yet undescribed in medical literature; though the so-called "typho-malarial fever" of sundry writers is akin in many points to certain forms of it. From the Customs Medical Reports (in particular Dr. Daly's Report on Newchwang of 1895) and other sources I gather that the disease has been and still is very widespread; and the noteworthy discrepancy in the names given to what is clearly one and the same disease, tends to corroborate the view above expressed (which is Dr. Daly's).

In all the cases which have come under my observation I have found in profusion a hæmatozoon hitherto undescribed; the clinical history of many of the cases agreed so well with the phases of the life-history of the parasite that the sole argument of any weight against their being associated as effect and cause lay in the fact that the same parasite was found in profusion in the blood of a large proportion of the healthy foreign residents of Chefoo, as well as of others, and of most of the Chinese whom I examined. It is only within the last few weeks that I have found, by cultivating the parasite in various nutritive media, the key to this and other difficulties.

The fever is as protean in every respect, in its severity, duration, symptoms, etc., as is the parasite, and as the former are intimately associated with the numerous and strangely varied phases in the life-history of the latter, much of which still requires elucidation, it seems advisable to begin by describing the parasite and such details of its life-history as have yet been made out. For the micro-photographs which illustrate this paper, and prove that the organisms to be described are not the offspring of a vivid imagination out of clumsy manipulation, etc., as has so often been the case in the history of microscopic investigations, I have to thank Dr. Reid, of Shanghai (Plate II, Fig. 1, Plate IV) and Consul Bristow, of Tientsin (Fig. 2—4, Plate IV).

Morphology.

If a drop of blood, preferably mixed with two or three times its volume of .75 % salt solution, so that the field be not too crowded, from a person thoroughly infested with these parasites, be examined with a high power, the field will soon be found swarming with some of the organisms depicted in Fig. 4, *Plate I*. Many of these are so like normal blood corpuscles that it is difficult at first to realise their real character; and it is to this fact no doubt that their having escaped recognition for so long must be attributed. *a*, Fig. 4, is a copy of a "Muriform" corpuscle taken from Hayem's "On Sang"

(Fig. 17, page 63); α , below it, depicts a very common variety of the adult parasite; this will be seen to differ from the corpuscle only in the fact that round its periphery bits of a brilliant black line are to be seen, which are continually changing their position, being now visible only on one side, now on the opposite one, now on three, rarely on all four sides at once; the object may be almost quiescent, or it may be in such active movement as to dismiss any doubt as to its being a living organism; it may turn over, so revealing a structure to be described later. Frequently the parasites are more spinose, or starry, like β , Fig. 4. If one such be carefully focussed down upon from above, a brilliant spot will first become clearly defined, the tip of one of the angular projections; as the focus is lowered this becomes a bright circle (β , 1), and then a double-contoured circle (β , 3), while several brilliant double-contoured writhing lines come also into view; finally (β , 3) the star-shaped body is clearly defined, and the elevations, which in optical section are double-contoured circles, are seen to be in constant change, one sinking down to a mere knob, or a plane surface, while others spring up elsewhere; the brilliant black ring, as in the other specimen, is also now apparent, at least sections of it, between the lateral projections, now on one side, now on others. ϵ and ζ are also common forms; η depicts one of the latter folded over. λ , 1, 2, 3, depict several phases of a less common form, more usually found in fever cases.

The majority of the organisms present their dorsal aspects; here and there may be found one with its ventral aspect uppermost (Fig. 5, except γ); in this case an opening is to be seen surrounded by a thick flexible lip, or sucker, which may be seen to dilate and contract its edge, sometimes extending beyond that of the creature's body; it is this edge, out of focus, which appears from the dorsal aspect as a brilliant black line. This ventral sucker is usually flattened (ϵ), but sometimes is shaped much like the corolla of a lily (δ). γ depicts this organ projecting so far from beneath a parasite dorsum up that it can be focussed down on, and its real nature be seen (the body should have been depicted slightly out of focus); all the objects in Fig. 5 are somewhat diagrammatic, in that the edge of the sucker and the body cannot be clearly defined simultaneously.

If the temperature be not too low (*e.g.*, below 50° F.), the organisms may be in very active, some in violent, motion; usually they "jog" gently about, only slowly changing their position in the field; but I have seen specimens darting about with a speed which would have taken them off the field in a flash, were it not too crowded, colliding with more placid ones with force adequate to displace the latter a distance two-three times their own diameter. Often they roll over and over, so affording a chance of studying the ventral sucker in profile.

Sometimes they may be seen with organs such as shown in Fig. 6, projecting; a had a bifid appendage, each arm ending in a bright knob, which



Fig. 1.



Fig. 2.



Fig. 3.

Fig. 4.



Fig. 5.



Fig. 6.



Fig. 11.



Fig. 10.



Fig. 7.



Fig. 8.

Plate I.

All magnified about 900 diameters, (Zeiss 1/12 oil immersion, ocular 4) except Fig. 8, which is about 600 diameters.



Fig. 9.

turned and twisted in all directions, being fully extended horizontally one moment, and then vertically, so as to be visible only in optical section. α 1 and α 2 depict successive phases with less than ten seconds between them. More common is the organ shown at β , Fig. 6, a brilliant central structure, which appears to be a closely coiled tube, extending from end to end of an excessively delicate membrane with a double contoured margin; two roots may sometimes be made out to the central tabular structure.

α , Fig. 11, depicts similar structures as seen in a stained permanent preparation; β , an organ projected by some of the parasites when suddenly acted on by 1 % solution of ozonic acid; and δ , a scrap of *débris*, much like normal elastic fibres, with which stained permanent preparations from these cases are very often crowded, and which I take to be portions of the above described organs.

If the blood specimen be quickly examined as soon as made the parasites may often be seen escaping from their corpuscular shells (Fig. 3); and others still confined, as β , γ , Fig. 2. γ shows one of the flat leaf-like parasites (ζ , Fig. 4) folded double inside a corpuscle, seen on edge. β is a reniform body, in which by careful focussing a double-contoured folded parasite may be seen; if the reniform body rolls over it becomes circular, with a lighter area in its centre (β), an appearance easily explicable now, but which puzzled me immensely during the months before I realised that I had a new hæmatozoon under observation. When a healthy person's blood has become infected, and the parasite is multiplying (a process usually associated with fever, but not always, so far as I know), a glance at a permanent stained blood preparation, slightly magnified, *e.g.*, 90 diameters, will often show areas as thickly crowded with black spots as if peppered over; a higher power resolves each such spot into a red corpuscle, infested with one or more small double-contoured circles, complete (b , Fig. 1) or incomplete (c); the latter varying from about the size of the former to nearly that of the containing corpuscle; the double contour is formed by brilliant black lines, especially if the object be only lying on the corpuscle, or close to its surface; if deeply buried in it, or close to the under surface, this brilliant blackness is wanting, and more than a casual glance is required to make out the double contour (a , Fig. 1).

In a preparation of fresh blood the same objects may be seen only as bright double-contoured bodies; they may be seen to move and alter in shape, (*e.g.*, a crescent straightening out,) and in so doing the infested corpuscle is often notably changed in shape and position. If a drop of blood be taken from a sufferer with the common mild form of fever, to be presently described, during or soon after one of the daily rises of temperature, many such red corpuscles, as is shown in Fig. 2, α , may be seen, with a small object deep in its substance, appearing of a bluish tinge in contrast with the reddish

yellow of the corpuscle. If kept under observation, under suitable conditions (sealed preparation, temperature not below 75° F.), for three or four hours, these small objects may be seen rapidly increasing in size, till they become like those shown in Fig. 2, *a*; each having a well-defined double margin, and striated as shown.

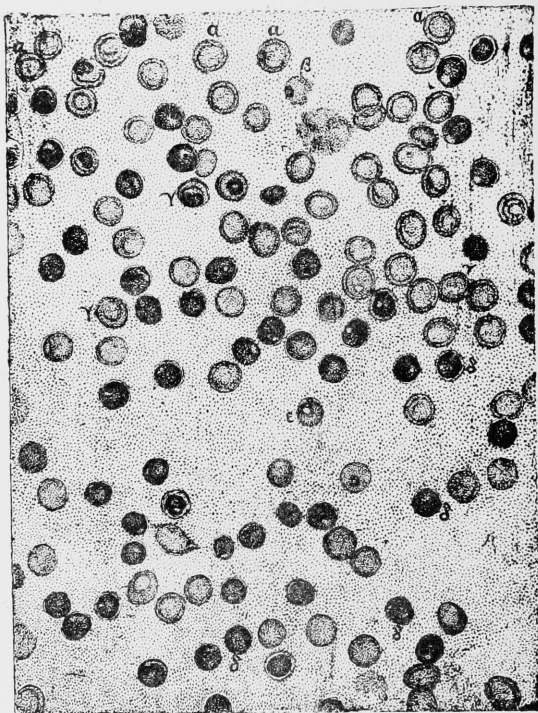
Such a blood preparation may be kept under observation in summer weather, for over a fortnight (nineteen days in one instance) if originally put up with aseptic precautions. The parasites very soon all become free; such normal corpuscles as there may be part with their hæmoglobin and become invisible, so that only living parasites are left. From day to day a certain number of these sporulate, and then apparently disintegrate; anyhow they disappear. Before sporulating the parasite in many cases sheds its proboscis; I have only observed this in those parasites, the more common, I believe, whose probosces are as shown in Fig. 6, *β*. It then becomes studded with small whitish spherules, which, when accurately focussed, become small angular particles (1, Fig. 7); when the parasite is seen in profile these particles are noted to be collected about one side, where the sharp contour is interrupted by an irregular more or less jagged interval; probably this is where the proboscis has been shed. In other instances, without this stage having been observed, the parasite (star-shaped, crenated, or flat leaf-like forms) becomes a perfectly clear sphere, double-contoured in optical section and of a light-greenish hue; a dark organ next appears in its interior, of varying shape, sometimes as shown at 3, Fig. 7; this may frequently be resolved into a coiled tube (4, Fig. 7), which may be seen writhing; inside this tube appears a string of the whitish spherules above mentioned; as it increases in length it projects from each end of the tube, reaches and penetrates the surface and then extends beyond it; the free part swinging vigorously in all directions until a portion separates, and, the ovules still attached to each other, dances away, usually out of the field. Besides these strings larger buds may be seen on many of the ovulating spheres; each appears to have a dark spot about its centre. When shed they also dance off, but less actively.

In permanent stained blood preparations the flat form of parasite is often found studded with these ovules (6, Fig. 7), while still retaining its normal shape. I have not observed this during life. Fig. 8, *Plate I*, depicts a couple of large spherical bodies, here joined into a dumb-bell like object, which abound in the blood in the graver varieties of the fever. They belong properly to the second generation.

Fig. 9 shows two phagocytes as seen in a fresh blood preparation from a patient on the day of his death from a pernicious variety of the disease. They contain a number of blue granules and blue-stained spores; the patient having been treated with methylene blue.

Plate II.

900 diameters.



α = free parasite, flat variety.

β = " " body out of focus, edge of contracted oral sucker nearly in focus.

γ = " " with ventral surface uppermost.

δ = infested red corpuscles; contained parasites nearly full-grown.

ϵ = " " ventral surface uppermost. " " "

Plate II is a photograph of a specimen of blood taken from a boy while critically ill with the fever. This film was prepared as usual, fixed in absolute alcohol, and stained with one per cent. watery solution of methyl green. Weak watery solutions cannot penetrate the (probably) chitinous coat of the adult parasites (α , α), which therefore are unstained. Several (γ) show well the oral orifice with the surrounding sucker; (in one case the light falls into this, so it shows up white; in another it leaves the whole sucker interior in dark shadow). β appears to be a parasite out of focus, with the ventral sucker contracted and nearly in focus. Most of the dark bodies (δ) are intracellular parasites, whose still soft cuticles have been penetrated by the stain; one (ϵ) shows very clearly its oral sucker, while the thin layer of enviroing red corpuscle is quite apparent.

For a long period I regarded these flat parasites (α) as genuine red corpuscles; and as they are often the only kind which persist during the methylene blue treatment to be described later I rejoiced in the belief that the blood had been completely cleared of its parasites. Close observation, however, with good lens and illumination, shows all the before described details, oral orifice, sucker, etc. This form is usually less active than the others; but they may be seen to curl their margins here and there, bend one end over, even in the most sluggish preparations when patiently watched.

The surface of the stained intra-corpuscular parasites in this preparation is so highly reflecting that it has prevented the striation of the parasites, visible in the original (*vide* Plate I, Fig. 2, α), being shown in the photograph.

Second Generation.

If a sterile culture fluid, bouillon or milk, be inoculated with a trace of infected blood, with the customary precautions of course, and the vessel containing it be then incubated for four or five days at about 35° to 40° C, it will then be found swarming with a great variety of organisms, a few only of which I propose to describe. If milk be the fluid used it gradually becomes less and less opaque; after three or four days a clear watery fluid separates from what looks like a mass of white curd. If a speck of the latter, with a drop of the fluid, be examined with a high power (900 diameters), the "curd" will be found to be composed of millions of small actively moving tubular organisms (Plate III, Fig. 2, β), which nearly all float with their long axes vertical, so that only a double-contoured circular object is seen; attached to it, however, is a brilliant speck, now inside, now outside, the said circle; focussed down to, this bright spot appears as a similar double-contoured circular object; occasionally one turns on its side, and reveals the fact that the two circles are merely the gaping ends of a hollow tubular organism.

Projecting from this mass, and mixed up with them, will be found numberless clear spherical bodies, with a sharp brilliant double contour in optical

section (Fig. 2); they increase in size while watched; the smaller ones rapidly equalling those which are big enough to be more or less flattened out by the cover-glass. Scattered here and there will be seen masses of granular matter with similar clear globular bodies projecting from them (Fig. 1, A.) These globular masses similarly increase rapidly in size, and also extend themselves in various directions with a sort of flowing protoplasmic motion, fast enough to be easily visible like the minute-hand of a large clock; fast enough for a marked difference to be visible from minute to minute as indicated in Fig. 1, *a*, *a'*, and *a''*. Small spheres may be seen budding from the exterior of the larger ones. As the free spherical bodies increase in size and number they press on each other; at each point of pressure the walls of the two spheres seem to melt together, their cavities are united, and the point of junction is only marked by a constriction. It is thus that the dumb-bell like object shown in Fig. 8, Plate I, is formed. If the preparation be left alone the spheres eventually will all melt into one huge bleb, filling the whole space under the cover-glass. *Fig. 3* depicts a fresh blood preparation from a patient acutely ill with the more serious form of fever associated with these parasites. It was sketched immediately after being made, and shows numerous huge blebs occupying a great part of the microscopic field; the corpuscles, etc., being crowded into their interstices.

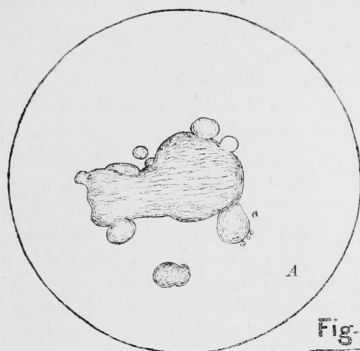
If a drop of glycerine, plus one-tenth per cent. of magenta, be run into such a preparation, after some time the blebs will take up the stain, and so form a good permanent preparation, demonstrating clearly that they are not merely the air-bubbles for which they have doubtless hitherto be mistaken.

Another organism found in the culture fluids is in shape much like the parasite shown in Plate II, *a*, *a*; differing chiefly in size, being 400 to 600 times as big, and in its possession of a long and curiously fashioned "proboscis."

Several other objects of interest are to be found in the culture fluids, but the above mentioned seem to be those of most clinical importance.

Physiology.

That the organisms of the first generation are very tenacious of life is shown by their existing for so many days, and ovulating, in an ordinary sealed cover-glass preparation, with no precautions to guard it from the changes of temperature between day and night in the autumn at Chefoo. They are very resistant to every drug which I have tried, in such strength as could be approximated to clinically, except one. They flourish in normal saline solution, to which has been added, carbolic acid, 1 to 1000; quinine bi-sulphate, 1 to 1000; Liq. Arsenicalis, 1 to 10,000; Salicylic Acid, 1 to 10,000; Salicin, 1 to 1000; also various essential oils, eucalyptus, peppermint, etc.; Hydrarg perchlor, 1 to 1000, kills them promptly; but they flourish in the blood of patients who have been for months slightly mercurialized for



a at 11 p.m.
a' at 11.04 p.m.
a'' at 11.05 p.m.



Fig.1.

Zeiss A. oc. 4=90 Diameters

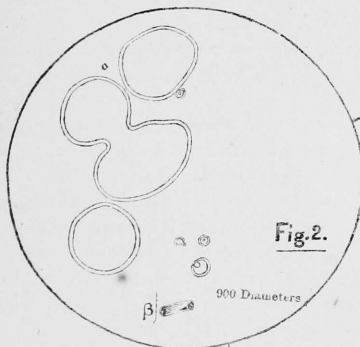


Fig.2.

900 Diameters



Fig.2~

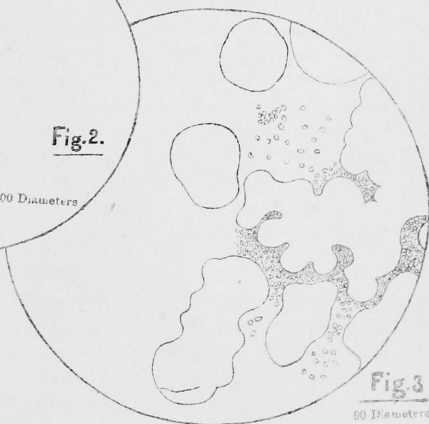


Fig.3

90 Diameters





Plate IV

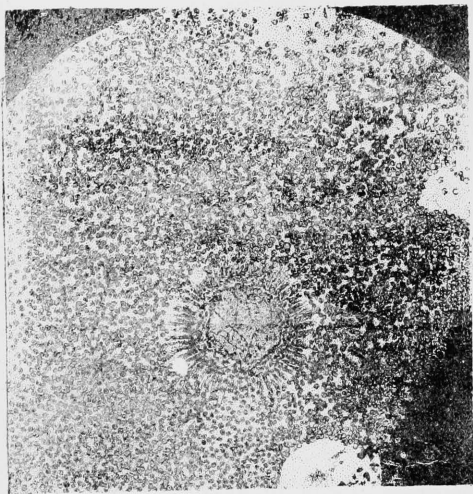


Fig.1.

80 diameters,



Fig.2.

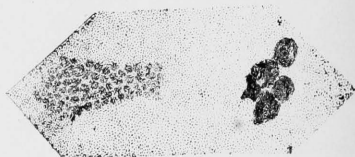


Fig.3.



Fig.4

syphilis. The only toxic drug which I have found so far is methylene blue; 1 in 400 kills them in a few minutes; 1 in 1000 in a few days. (By this means the parasite character of the structures *a* in Plate II can be readily demonstrated).

If a pregnant woman's blood be infected the baby's will be so also; this I have found to be the case in one instance.

Cows are liable to be infected; this I infer from the fact that I have found the parasites in enormous numbers in several specimens of Chefoo milk; this fact appears to me adequate to account for the wide prevalence of the infection in Chefoo at present; during the last four months I have never found any non-infected blood in Chefoo, having examined over thirty residents, three at least of whom were free from infection last August.

As I have found these parasites in over 150 cases now, the majority being non-residents in Chefoo (people from all the coast ports, Kansu and other inland provinces, etc.), I believe them to be very widely spread. Their appearance in Chefoo, hitherto free from fevers of local origin (except typhoid) I am inclined to attribute to certain reclamation work, involving the disturbance of a very foul fore-shore close to the Settlement.

PLATE IV and *Fig. 10*, PLATE I, represent stages in the life cycle of another new *Hæmatozoon*, which I have provisionally termed "*Medusa Sanguinis Hominis*," as the adult forms have a remarkable resemblance to an ordinary jelly-fish. I have only seen it in eight cases, and have had little opportunity to study it. *Fig. 2* and *4* show the inferior aspects of two large specimens; the crenulated margin of the swimming bell is well shown by *Fig. 2*. When alive they swim about and turn over and over with a speed which baffles any attempt at sketching. *Fig. 3* shows a group of small ones. *Fig. 1* what I take to be a reproductive phase; at the extremity of some of the branches are borne small sub-spherical bodies, gynophores I believe; these are shed free into the blood plasma, where they develop into objects such as are shown in *Fig. 10*, Plate I; *2*, *3* and *5* are successive phases of one parasite, sketched as fast as possible; a manubrium, with terminal appendages, is clearly evident. *Fig. 4* shows a small free medusa; and *Fig. 1* a 3-tentacled object, still inclosed in a shell, which I have several times seen free in fast blood preparations, moving about with great activity. Further details will be found in my Customs' Report for the year ending September 30th, 1896, at which period I attri-

Note.—It may be of use to state (1) that Hayem's fluid (Hydrarg. Perchlor $\frac{1}{2}$ part, Sodium Chloride 1 part, Sodium Sulphate 5 parts, Distilled Water 200 parts,) mixed with fresh blood, will fix and preserve all the formed elements without distortion.

To make permanent stained preparations a very useful method is to smear two thin cover-glasses in the usual way; let them dry spontaneously (protected from dust), fix in absolute alcohol for 3 or 5 minutes (or, by exposure to Ozmic Acid vapour for 15 min.), let dry; then place, smeared surface up, in a watch-glass, run on to each 2 or 3 drops of a saturated alcoholic solution of methyl violet (or m. green, or other aniline colour); cover; after 3 or 5 minutes wash in plenty of distilled water till no more colour comes away; dry; and mount dry.

For the *Medusa Sang. Hom.* it is best to use Chunzynoky's fluid and mount in balsam.

buted to this a clinical import which I now incline to ascribe rather to the other hæmatozoon, with which it has always been associated in my experience.

Pathology.

The pyrexia commonly associated with the first described parasite (in future *the* parasite) is characterized (1) by extreme irregularity, both in its duration and severity and in the time at which the daily exacerbations, often more than one, occur; and (2) by the fact that this pyrexia is usually the only striking symptom, *i.e.*, the common symptoms of pyrexia, malaise headache, thirst, etc., etc., are present, but nothing else.

In children it is a common event for the temperature to flash up to 104° or 105° for an evening or two, without any initial rigor, fit, or vomiting; the child is hot and tired, and the mother is usually astonished if she happen to take the temperature to find it so high. Next morning it may be normal, flash up again in the evening, and so on for two or three days, when the fever ceases, leaving the child little the worse for it. The same happens in adults, except that the rise is usually less, and may occur at any hour of the day. Very often, however, the fever continues from day to-day, and remits only; (see Chart 1.)

At first the disease may be regarded as malarial remittent; but as quinine proves entirely useless, and the fever persists week after week, it is apt to be reluctantly diagnosed as typhoid fever; the long duration of the fever being, however, the only point in which it resembles typhoid. Sometimes there is more or less acute shooting pain in the limbs, usually in the course of the nerve trunks, not located chiefly in the joint. (When these are associated with fever of a few days' duration only, as mentioned above, it is apt to be regarded as dengue, which, however, is an exclusively tropical disease, is usually accompanied by a distinctive rash; the joint pains are much more severe, etc., etc).

There may be slight bronchial catarrh; sometimes slight intestinal catarrh; constipation is, however, the rule. Spleen not affected. Liver sometimes tender. After persisting for three to four or five weeks, sometimes longer, the fever may gradually cease, and the patient is considered to have had typhoid or typho-malarial fever, according to the views of his adviser.

Sometimes, however, after running this benign course for a while the temperature suddenly attains and persists at a much higher level; serious symptoms speedily supervene, the breathing becomes quick and laboured, the pulse very rapid and small, then coma sets in more or less rapidly, often with twitchings of the face and other muscles, suggestive of cortical irritation, and death ends the scene, invariably I believe; for, considering the condition of the blood it is difficult to imagine how it could be otherwise. Such cases are likely to be classed as pernicious malarial remittent fever. In

CHART No. 1. Male. Age 30.

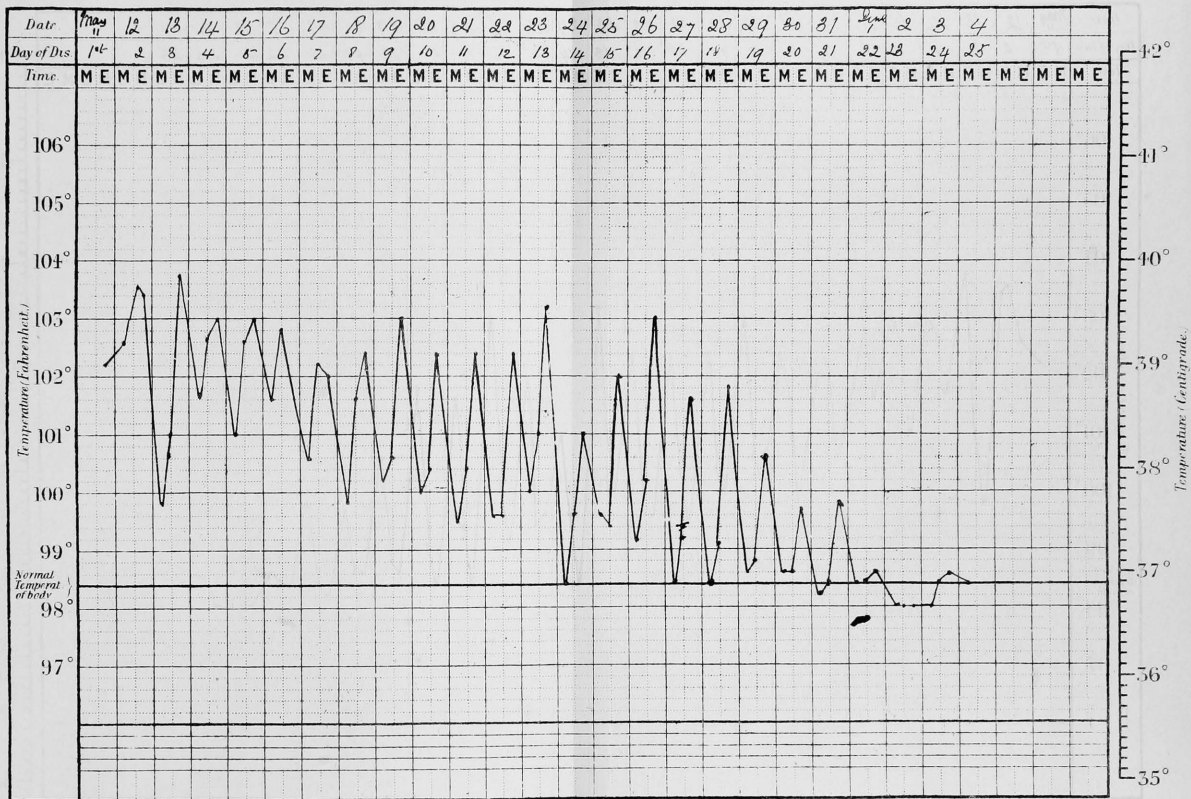


CHART No. 2. Lieut. U.S.S. Olympia. Age 32.

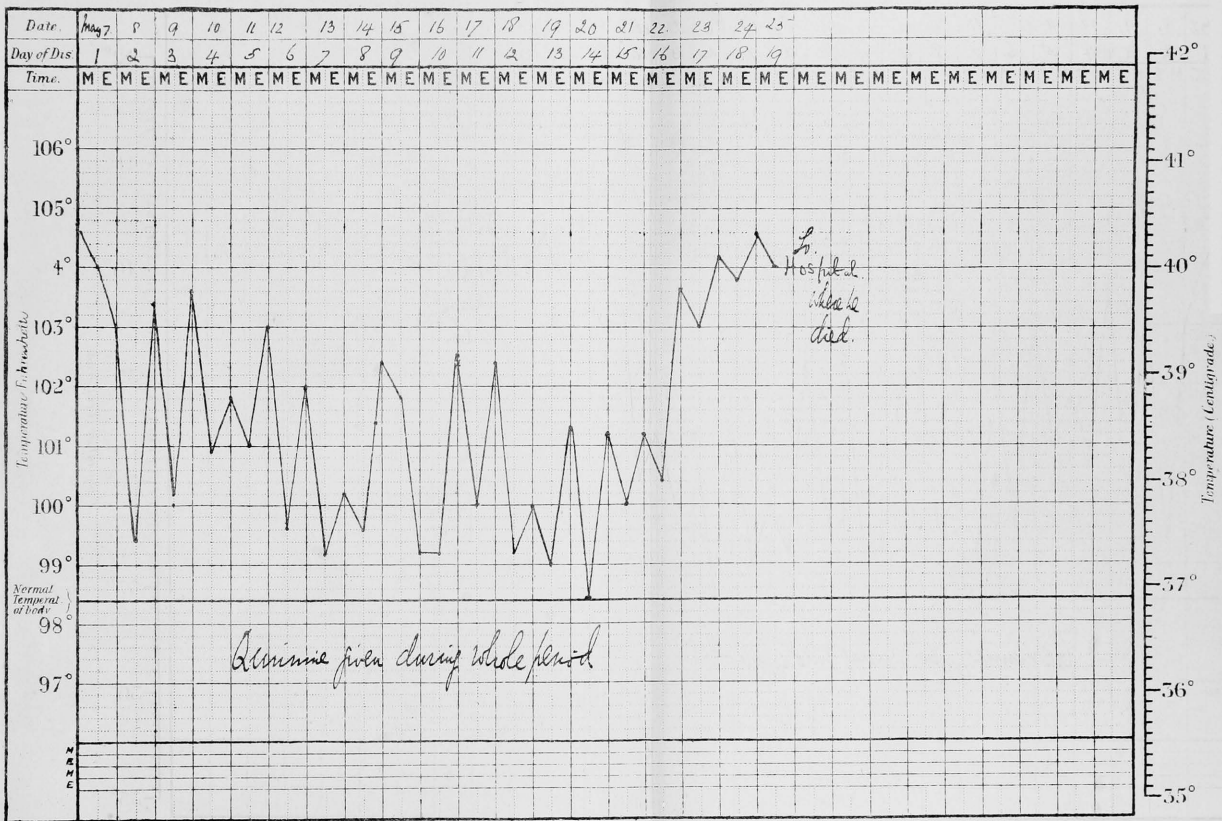


CHART No. 3.

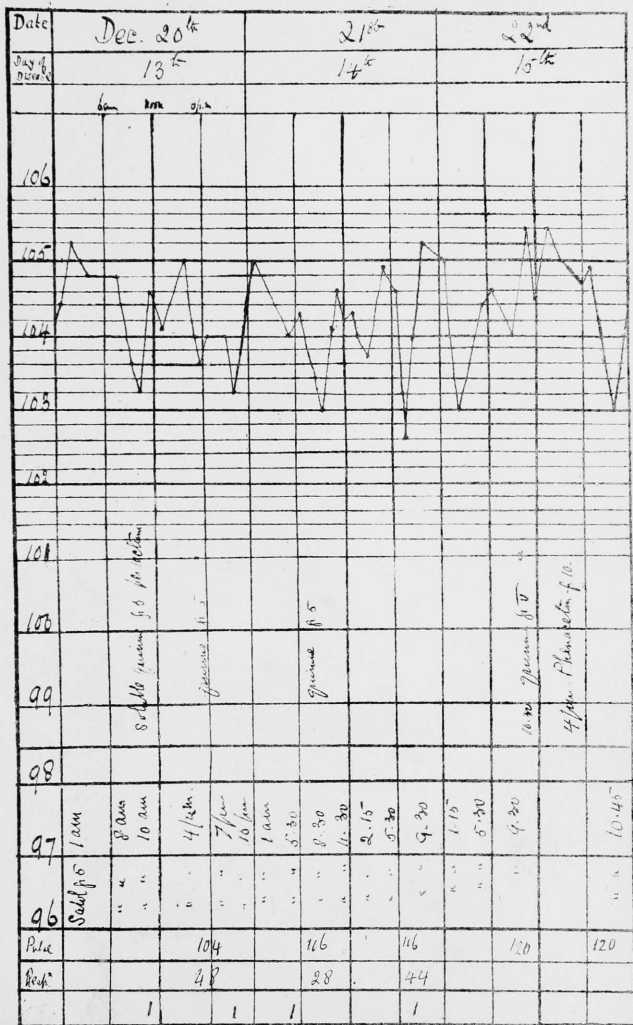
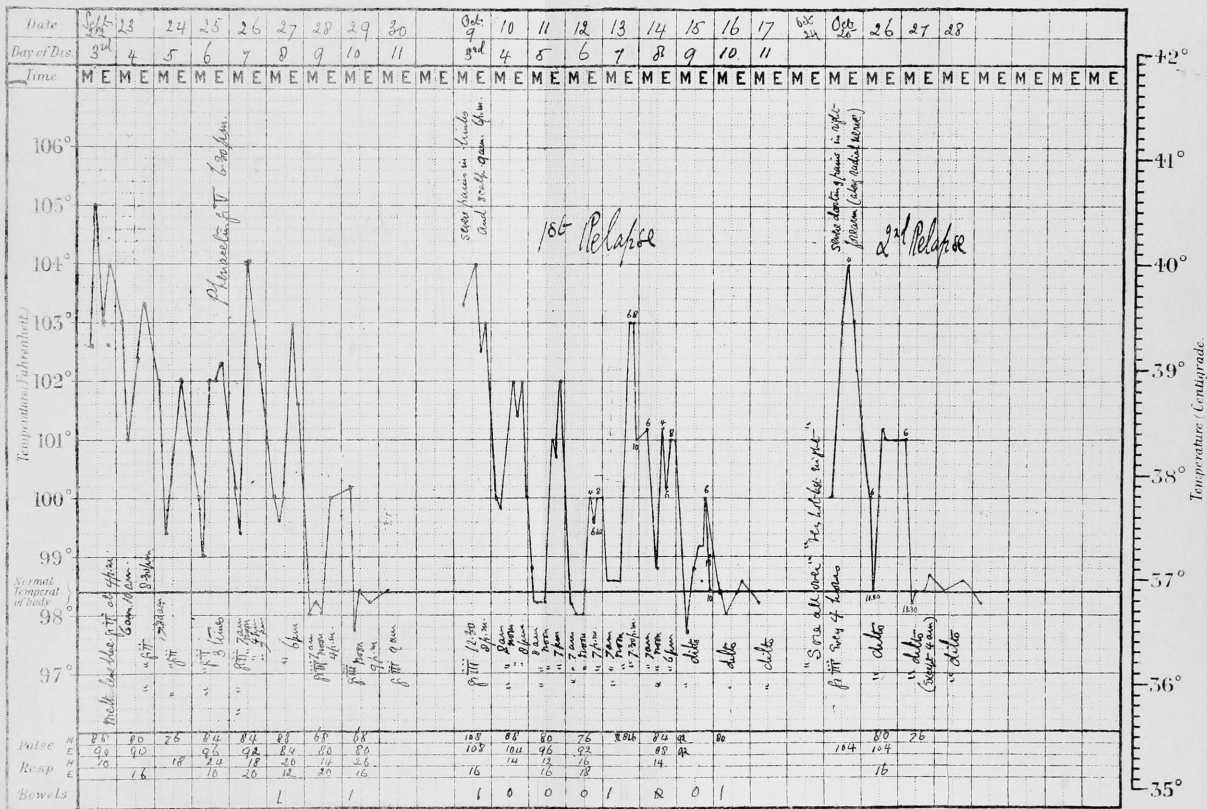


CHART No. 4.

Female, Age 32.



the benign form of the fever each rise of temperature will be found to correspond precisely with the setting free of masses of spores, and only those forms of the parasite which have been described as belonging to the first generation will be found in the blood, at least in any quantity. The onset of dangerous symptoms coincides with the appearance in profusion of the organisms of the second generation, and it is easy to see how the rapidly growing spherical organisms must block the peripheral cerebral vessels.

If the temperature chart be constructed on such a scale as the one here shown, (see Chart No. 3) the irregularity of the fever becomes clearly evident. It takes less than twenty-four hours for a parasite to reach maturity, and soon after the commencement of the case the blood will contain, at any moment, several generations, the sporulation of each of which is marked by a rise of temperature to a height dependent on the number of sporulating parasites. In this case salol was being used, but it proved to be without effect on the parasites, and with very little on the fever, so it was discontinued.

Chart No. 4 shows how an attack of fever, due to these parasites, which it seems justifiable to assume would have run one of the usual courses, as shown by charts 1 and 2, was cut short by the use of methylene blue, a drug which experiment and experience (in about twenty cases) have led me to consider a semi-specific for this fever. In most of my cases, when the fever has subsided under the influence of methylene blue, it has not returned; in this one there were three relapses of progressively decreasing severity, the third lasting only one day. It is noteworthy that each occurred the day after the use of methylene blue was entirely suspended. The process of cure in this fever is, I believe, the attainment by the human organism of a tolerance for the parasite, which the blood seems never to rid itself of; at least I have never seen it do so. It is, I find, impossible to administer methylene blue in sufficient quantity to totally destroy the parasites, as can be done on the microscope stage; and its use seems to be in its power of depressing the activity of the parasites and destroying many ovules, and so giving the body time to attain tolerance of them; it may be to make its blood plasma more toxic to them.

I usually administer methylene blue in gelatine capsules; gr. 1 to 4 every three or four hours according to the age of the patient and the severity of the symptoms. It may nauseate at first, but is soon easily tolerated. It often causes vesical irritability, which may be allayed by the use of spirits of nutmeg, 5 to 10 minims with each dose. A large proportion of cases require no treatment other than rational diet, rest, etc. If the fever persist methylene blue may be used to cut it short. Salol is of use in relieving the pains in the limbs and scalp sometimes complained of.

As regards the remarkable fact that healthy persons may be found with their blood thoroughly infested with these parasites it is to be remarked that by careful inquiry some departure from the normal health standard is usually to be detected. Several men, whose blood I have found thus infested, have told me that since an attack of "typhoid fever" some years before they "had never been the same since;" they were subject to fits of lassitude, mental depression, etc., before unknown; their mind was not what it had been, etc. Such a blood state is not one to be entirely disregarded; as long as no other cause of ill-health is operative the host may suffer no ill-effects from their presence; but with the co-operation of any such cause they may burst into activity and determine a fatal issue. This danger has recently been forcibly impressed upon me by the case of a six months' old baby who was passing satisfactorily through a mild attack of discrete small-pox; the pustules were drying up, and the small-pox fever subsiding, when the temperature suddenly ran up again to 104° one night, and 108° the next morning, when it died. The blood was a translucent fluid, red-tinted, and under the microscope looked like a bouillon culture of the parasites. In this instance all the members of the family, four, were infected, and the two older children had had flashes of fever, such as have been described last summer.

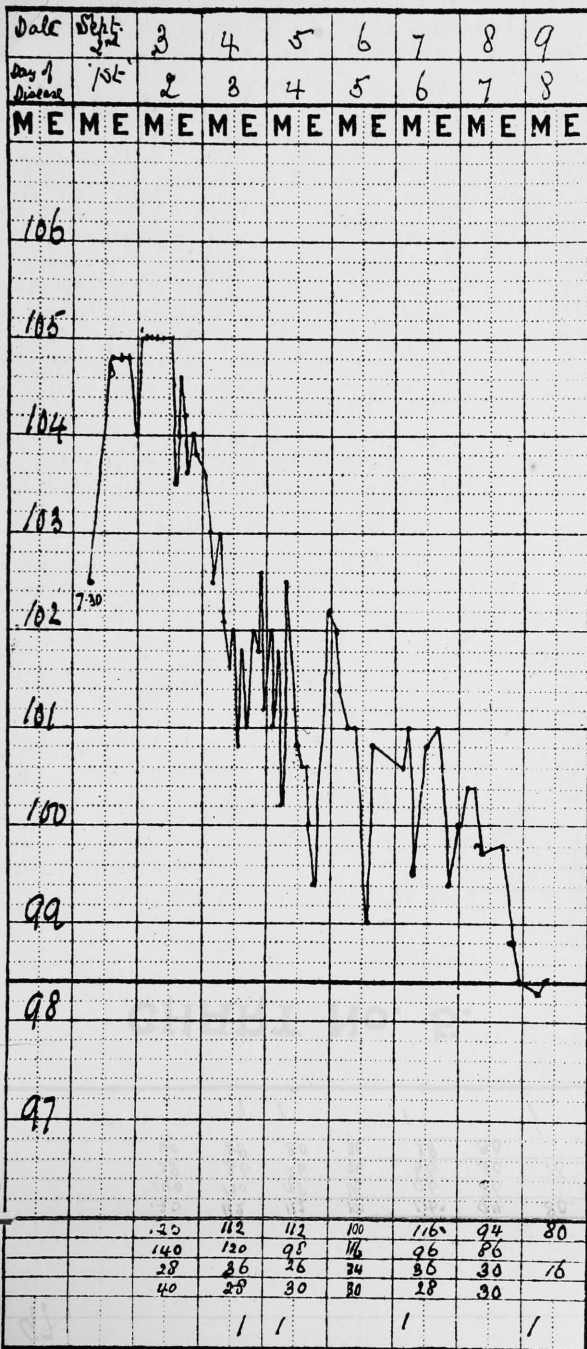
Medusa Sanguinis Hominis.

Three cases of fever of a very severe type came under my care last autumn, in which besides the first described parasite this other hæmatozoon was present in great profusion. As the chart (see chart 5) shows the fever set in suddenly, rose to a high level and remained there until treatment brought it down. The accompanying symptoms were of the most menacing character. There was delirium soon passing into coma, very marked muscular twitchings, very frequent respirations, etc. Methylene blue in these cases proved quite specific. Within a few hours of its administration no more live *medusæ* were found in the blood, but plenty of motionless ones, presumably dead.

Two of the three cases recovered satisfactorily; the third, who had also malarial fever of a severe type, (the blood swarming with the pigmented plasmodia of the summer-autumn fever of the Italian observers), died a day or two after I began the use of the blue. It was in this case that I first observed the new hæmatozoa. In two other cases the parasites were few and the fever slight, and methylene blue effected speedy cures.

Recently a missionary colleague kindly sent me a flesh blood preparation from a very anæmic Chinaman, containing several large *medusæ*; he had no fever at the time, nor any history of any recent attack. He subsequently informed me that they speedily vanished from the blood under ordinary toxic treatment. It is therefore evident that the morbid phenomena associated

Male. Age 8.



with this medusoid organism, its life history and other points, all require much further investigation.

Diagnosis.

A microscope is evidently almost essential for the conclusive diagnosis of the various types of fever associated with the first described parasite; though careful consideration of the symptoms, and especially of the temperature chart, may suffice if no microscope be obtainable. High magnifying power is essential for the study of the parasites, but not for their mere recognition. Magnification to the extent of ninety diameters only suffices for this; once the observer is well acquainted with their appearance, with this magnification, on focussing down to a field full of parasites, the field before becoming defined is seen to be full of glittering objects, owing to their high refrangibility; when clearly defined, instead of the normal faintly yellowish red disks, whose faint shading indicates their bi-concave figure, small circles bounded by sharp black lines are seen, and in the centre of each, or more often, close to one side, is a bright spot, such as no normal corpuscle ever shows. Exceptionally their individual movements are lively enough to be detected at a glance.

A drug more toxic to them than methylene blue, and harmless to the host, is a great desideratum, and it is to be hoped that some observers will direct their efforts to this end.



Selected Article.

REMARKS ON THE CLINICAL VALUE OF
EHRlich's METHODS OF EXAMINA-
TION OF THE BLOOD.*

By WILLIAM SYDNEY THAYER, M.D.,
*Resident Physician to the Johns Hopkins
Hospital, Baltimore.*

Von Jaksch, in an excellent address delivered at Franzensbad in May, 1890, speaks particularly of practical methods of examination of the blood. He lays stress on the value of the microscopical examination of the fresh blood, a point of considerable importance, which is very often overlooked. He says later: "The microscope, the counting of the cells, the estimation of the hæmoglobin are the methods which are feasible to the modern practising physician. Other methods of examination of the blood, which have given valuable results, cannot be used in all cases by the practitioner on account of their inconvenience. Thus the methods of blood-staining practised by Ehrlich possess certainly great value, but their employment is too complicated."

I mean to speak to-night mainly of just these methods of preparing and examining dried specimens of blood for which we are chiefly indebted to Ehrlich; for I feel, in opposition to Von Jaksch, that they are in many ways the most valuable and easily applied methods open to the practising physician. Upon other more familiar and perhaps not less useful, methods, such as the counting of the individual elements and the estimation of the hæmoglobin, I shall speak only incidentally. The enormous multiplication in late years of methods of examining and studying the various morphological elements of the blood can be seen by a glance at the article of

Mueller in the *Centralblatt für Allgemeine Pathologie und Pathologische Anatomie* for the 31st of October and the 18th of November, 1892, where there are nearly five pages of references alone. Many of these methods, valuable as they may be, are not practicable to the ordinary practitioner; and I wish particularly to show in what ways the examination of dried specimens may be of real value in everyday work.

The methods of examining cover-glass specimens of blood were introduced by Ehrlich in 1878 and 1879. Following the methods which Koch and others used in staining preparations of bacteria, he found that when an extremely thin layer of blood was spread out upon the cover-glass and allowed to dry immediately, the shape and general characteristics of the blood corpuscles were preserved as well, if not better, than by any known methods. In preparing such a specimen, however, one must exercise considerable care. The slightest moisture from the fingers may be alone sufficient to spoil the specimen of blood. Any impurity on the cover-glass will bring about the same result; therefore the greatest care should be taken in the preparation of the glass; it should be washed in alcohol immediately before use. If this precaution is literally carried out much of the difficulty in making a preparation of blood is already overcome. The cover-glasses should not be handled by the fingers; it is best to use two pairs of forceps, which have the blades filed down to almost a knife edge; one may be a clamp forceps, and the other may be an ordinary dressing forceps, the blades of which have been filed down in order that they may not break the thin cover-glasses. After the cover-glasses have been carefully wiped, so that no visible particle of dust lies upon them, one of

* Reprinted from the Boston Medical and Surgical Journal.

them is touched to the drop of blood flowing from the finger-tip or the lobe of the ear,* and allowed to fall immediately upon the other. If the glasses are clean, the drop of blood spreads out instantly, and the upper glass is drawn off the lower one, care being taken not to change its plane. The thin layer of blood on each glass will then dry almost immediately, particularly if it is held for a moment above a flame, so as to be very slightly heated. Particular stress is laid upon this instantaneous drying by Uskow, who is able by this method to preserve the most minute chromatin network in the nuclei. Well-prepared specimens of this sort show the red corpuscles lying side by side in the field of vision with their natural shape, free from any crenation or other changes which one may observe so soon in the fresh specimen. The presence of crenated corpuscles is a sure sign that the preparation has not been properly made, and that it is unreliable. The specimens thus dried may be kept for almost any length of time. They are, of course, more satisfactory if examined immediately; but I have stained perfectly clear specimens which were three or four years old. It is well to wash the finger or the ear in alcohol and ether before taking blood, but it may be just as satisfactory to wipe away the first several drops of blood, thus washing the part, as it were, in the blood itself.

Before examining the specimens, however, further steps must be taken to "fix" the various elements, particularly the red corpuscles, that the hæmoglobin, which is easily soluble in

* It is best to use a sharp lancet; its application is much less painful than that of a needle, while much more blood flows from a small stab. I prefer to take the blood from the lobe of the ear; the part is much less sensitive than the finger-tip. If a sharp knife or lancet is used, the small cut necessary may be scarcely felt by the patient. The situation of the ear, moreover, is such that the instrument may often be concealed from the patient, a point of considerable importance in nervous individuals and young children.

water, may not be dissolved and washed away on applying the stain. This result may be accomplished in several ways. To go into a thorough analysis of the different methods would more than occupy my whole time, and I will merely mention one or two of the most simple and reliable methods.

A very satisfactory method is to drop the cover-glass into a solution of absolute alcohol and ether of equal parts (Nikiforff's method). In a half-hour the specimen will be ready to stain. For quick work a shorter time may suffice.

Absolute alcohol alone for ten to thirty minutes will give fairly good results.

Ehrlich first recommended the use of heat in fixing a specimen of blood, a method which is probably, upon the whole, the most satisfactory of a l. He advises the use of a copper plate (mine is about $40 \times 10 \times \frac{1}{2}$ centimetres), which is placed over a flame, burning at a fixed height. By finding the boiling point (by adding drops of water), 100° C. may be easily determined. The specimens are placed with the face upon the plate, about three centimetres inside the boiling point, a temperature of between 100° to 120° , and may be left there for a varying time, according to the solution with which the specimen is to be stained. For watery neutral solutions a short time suffices; very acid solutions and those containing glycerine call for a longer heating of the specimen. Ordinary specimens may be heated from one to two hours, though for quick clinical work a much shorter time often suffices. The specimen is now prepared for staining.

Before speaking more exactly of the methods of staining, I want to speak first of the theory on which Ehrlich proceeded in his work. He was first led into applying his method of contrast staining or "color analysis," as he calls it, in the study of the leucocytes. Max Schultze was the first to direct attention to the fact that the leucocyte is not a morphological unity; and

Ehrlich in studying these elements discovered that the granules which they contained, which many had noticed, and Max Schultze in particular had described, might be divided into classes having affinities for certain distinct chemical classes of coloring matters. He found that between these various granulations there existed constant differences: (1) in their relation to dissolving substances—water, acids, alcohol, glycerine, etc.; (2) in their size, form, and degree of refraction; (3) in the way they are influenced by high temperatures; (4) in their distribution in the cell body. He believes that these granules originate in the cell, and are products of a specific secretory property of the protoplasm. He has called them the "specific granulations of the blood." These granules he has classified mainly according to their affinity for the aniline coloring matters.

He divides the aniline colors into two groups: (1) the *acid* coloring matters, and (2) the *basic* coloring matters. The *acid* coloring matters are those in which the staining principle is an acid; for instance, picric acid of ammonium, where the staining principle is the picric acid. Some of the more important acid colors are eosin, martius yellow, the salts of picric acid, aurantia, indulin, nigrosin, tropæolin O. O., Bordeaux, ponceau, and acid fuchsin.

The *basic* coloring matters are those in which the staining principle is a base, where the acid is an indifferent substance as regards the staining; for instance, fuchsin, Bismarck brown, safranin, methylene blue, methyl violet, methyl green, etc.

Ehrlich, as was said above, has differentiated various distinct classes of granules—seven in all. Of these, however, three only are of practical importance in human blood, and only two, indeed, have any great value. In the first place Ehrlich found, in certain leucocytes in human blood, large granules of a round or ovoid shape, having in the fresh state a peculiar yellowish-green refractive

appearance, suggesting fat (the coarsely granular leucocytes of Schultze). These granules had a particular affinity for the acid coloring matters; they were stained by all members of this group, and by this group alone. Owing to their marked affinity for eosin, Ehrlich named these *eosinophilic* granules.

Again he found a class of granulation which was stained by basic coloring matters alone. This *basophilic* granulation occurs in a very small proportion of the leucocytes in normal blood, and is as yet of little practical value in blood examination. The cells containing these granules were first called in German "Mastzellen," a name which they have retained in other languages. This granulation is more common in certain connective-tissue cells in the fixed tissues than in the blood. Here the granules have not been infrequently mistaken for micro-organisms. The basophilic granules of the blood are of an equal size. They are less refractive than the eosinophilic granules, and in the dried specimens they are usually seen surrounding the central clear nucleus in the shape of a ring. They rarely have the morula appearance that the eosinophilic cells often show.

The third granulation, which is by far the commonest one in the human blood, is one which is stained neither by acid nor by basic coloring matters alone, but only by a fluid which contains a mixture of an acid and a basic coloring matter together, the acid color being in excess. This granulation Ehrlich calls *neutrophilic*. The neutrophilic granules are smaller and more irregularly shaped than either the eosinophilic or basophilic granules. They occur in about three-fourths of the leucocytes in normal blood.

Methods of Staining.

It will be worth while here to mention only a few of the staining methods which have seemed to me most practical; of other methods a full summary may be found in Mueller's article before referred to.

The basic colors generally stain the nuclei. The best examples of these are perhaps methylene blue and ordinary basic fuchsin. Either employed alone stains the nuclei beautifully, and also any bacteria or protozoa which may be present in the blood. For instance, in staining malarial organisms I have found a simple aqueous solution of methylene blue as satisfactory a stain as any. The basophilic granules (mastzellen) are also stained by this class of coloring matters.

The acid colors stain the red corpuscles and the eosinophilic granules.

A very convenient stain for practical use is as follows:—

Eosin	0.5
Alcohol (70 %)	100.0

The prepared cover-glass should be stained for a few minutes in this solution (which has been diluted one-half with water), washed with water, dried in the air or between filter paper, and stained for three-quarters of a minute in a saturated aqueous solution of methylene blue, which should be diluted one-half with water before using. By this method the red corpuscles are stained red, the nuclei blue, the eosinophilic granules a brilliant red, and any bacteria or protozoa blue. Another solution which gives satisfactory results is that of Czinzinski:—

Methylene blue, concentrated aqueous solution	40
One-half per cent. solution of eosin in 70 % alcohol	20
Distilled water	40

The covers may be fixed in absolute alcohol from five minutes to half an hour, and stained from three to six hours in the thermostat at 37° C. This method is particularly recommended by Canon for showing the eosinophilic cells and the mastzellen; it has also been used by the same author to demonstrate the bacilli of influenza in the blood.

To bring out the neutrophilic granules the best solution is that recommended by Ehrlich, the mixture of acid fuchsin, methyl green, and orange G; it brings out most of the more important points in the blood.

This stain is perhaps the most convenient for every-day use, while it has formed the basis for the most valuable classifications of the leucocytes which have been made. The methods of preparation are very numerous (see Muller's article). Ehrlich advises the following mixture*:—

Saturated aqueous solution orange G	125
Saturated solution (in 20 % alcohol) of acid fuchsin	125
Alcohol, absolute	75
Saturated aqueous solution methyl green	125

The methyl green must be added drop by drop while stirring or shaking the solution. The solution must stand some weeks, and the fluid to be used should be taken with a pipette from the middle of the solution.

Later Ehrlich advises a different procedure:—

Sat. aq. sol. orange G	120-135
" " " acid fuchsin	80-165
" " " methylene green	125
Water	300
Absolute alcohol	200
Glycerine	100

A satisfactory solution may be prepared as follows:—

Sat. aq. sol. acid fuchsin	2
Water	3
Sat. aq. sol. orange G	6.25
" " " methyl green	6

To be added drop by drop, while shaking the solution.

Water	15
Alcohol	10
Glycerine	5

The cover-glass which has been heated for from five minutes to two hours at a temperature of 100°-120° C., or has been hardened in alcohol and ether, is stained in this solution for from two to five minutes, washed in water, and dried in the air, or, if the specimen has been heated for an hour or more, between filter paper

*There is, unfortunately, a considerable difference between different preparations of these aniline colors and it is always well to determine the source of the materials one uses. I use generally the colors from the *Berliner Gesellschaft für Anilen Fabrikation*, which can be obtained from G. König, Dorotheen Str. 28, Berliner, N.W. Grübler's colors are also reliable.

and mounted in oil or balsam. Specimens heated one to two hours * stain better than those which have been heated a short time, but perfectly satisfactory results for ordinary work may be obtained with specimens heated from five to ten minutes.

With this stain the red corpuscles are stained an orange or buff color, the nuclei of the colorless corpuscles green, the neutrophilic granules a violet or lilac color, the eosinophilic granules a deep red. The nuclei of nucleated red corpuscles, when present, are stained an intensely deep green, almost black. With a little practice the differentiation of the eosinophilic and neutrophilic granules is generally easy.

By the employment of various staining reagents—I say reagents because the staining of these granules is a distinct micro-chemical reaction—Ehrlich differentiated the following varieties of leucocytes in normal human blood †:—

(1) Lymphocytes, small cells about the size of a red corpuscle, the body of which is filled with a large, round, intensely staining nucleus, while the protoplasm is reduced to a small border surrounding the nucleus.

(2) Voluminous cells, which have a relatively large, oval, or ovoid, faintly staining nucleus, and a relatively extensively developed protoplasm.

(3) Structures of a similar character, which are distinguished from the former only in that the nucleus has certain indentations which often give it the shape of a wallet.

(4) Very numerous, somewhat smaller bodies, which are characterized particularly by the polymorphous shape of the nucleus. This nucleus, Ehrlich says, may, under the influence of reagents, break into

several separate fragments; hence the perhaps not entirely fitting name "polynuclear." The protoplasm of these cells is filled with fine neutrophilic granules.

(5) Eosinophilic leucocytes; cells of about the same size as the latter variety, with a single, round, ovoid or polymorphous nucleus, while the protoplasm is filled with eosinophilic granules.

The origin of the lymphocytes, Ehrlich traces to the lymphatic tissues of the body. The large mononuclear elements come apparently from both the bone marrow and the spleen, changing in the blood-current into the polynuclear neutrophilic elements. The eosinophilic leucocytes arise in all probability in the bone marrow.

Uskow has recently studied the colorless corpuscles by the method of contrast staining with great care, and has made a more minute classification. He divides the corpuscles into:—

A. Lymphocytes: the smallest form of corpuscle, consisting of a round nucleus (sometimes having an indentation) surrounded by a thin rim of protoplasm. The protoplasm in the preparation is often separated from the nucleus by a bright, sharp ring. Both protoplasm and nucleus are stained intensely. These he divides into:—

(1) Small lymphocytes, which are the size of red corpuscles, or smaller.

(2) Large lymphocytes, which are somewhat larger, in which the protoplasmic ring about the nucleus is slightly larger and more irregular, sometimes showing rounded projections.

B. Transparent corpuscles: these are distinguished by their richness in protoplasm, which takes no stain whatever, and looks like a vacuum in the faintly stained field of the preparation. The nucleus is homogeneous, round, oval or bean shaped, and lies usually eccentrically; it stains more feebly than the nucleus of the lymphocytes. He divides them into:—

* In some cases of pernicious anemia the specimen should be placed at boiling point or even outside of it and must not be heated longer than one hour.

† For careful study of the blood, lenses of high power must be used. The Zeiss 1-12 oil immersion lens, the Leitz 1-12 or the Winkel 1-14, are all satisfactory.

(3) Small transparent corpuscles, which are about the size of large lymphocytes; these have often a somewhat squarish shape, with sharply-rounded corners.

(4) Large transparent corpuscles, which are three to five times the size of the red corpuscles. The nucleus in the preparation is almost always eccentric.

(5) Giant transparent corpuscles. These are the largest white corpuscles seen in the blood. They have often one or two deep indentations in the nucleus.

C. Transitional forms: corpuscles with protoplasm which stands about midway between that of the lymphocytes and that of the transparent corpuscles in its affinity for coloring matters. The smallest are slightly larger than lymphocytes, and the largest are almost as large as the large transparent forms. The nucleus stains more intensely than the protoplasm, and has almost no light rim about its periphery. These he divides into:—

(6) Small transitional forms (giant lymphocytes) which are like small transparent forms with a slight staining of the protoplasm.

(7) Large transitional forms.

(8) Giant transitional forms. These last two forms correspond in every respect to the transparent leucocytes, excepting in their slight ability to take stain.

D. (9) "Multinuclear" neutrophilic leucocytes. These are two or three times as large as red blood corpuscles and are easily distinguished by the deeply-staining irregularly-shaped nucleus. The protoplasm is relatively of considerable extent, as compared with the size of the nucleus. It takes little stain itself, but is filled with small neutrophilic granules. These he divides into:—

(a) Those with a thick, rod-like nucleus, which takes a comparatively light stain, while the neutrophilic granules also are less intensely stained than in those with the more irregular

nuclei. These, Uskow thinks, are transitional forms between the mononuclear leucocytes and the forms with more markedly polymorphous nuclei.

(b) The leucocytes with a single rod-like nucleus which is bent and twisted upon itself, being rounded at both ends.

(c) The apparently multinuclear leucocytes. Here the nucleus is not really divided, but all the pieces are united by small filaments. They are larger than the other kinds of neutrophilic cells. These neutrophilic cells are of various sizes, from but little above the size of a red corpuscle, to nearly that of the larger transitional forms. The fact that one at times finds very small neutrophilic elements, Uskow suggests may be due to the fact that the change to multinuclear may occur from transition forms before these have reached the giant size, though this, he believes, is not the rule. He describes also multinuclear leucocytes with vacuoles.

(10) Eosinophilic leucocytes.

Uskow believes that the lymphocytes arise from the lymphatic tissues of the body, the large lymphocytes arising mainly from the follicles of the spleen, the smaller from the lymphatic glands. In the bone-marrow, one finds on cover-glass specimens, or on section, scarcely any lymphocytes, but mainly transparent and transitional forms, which are also found in the spleen. In the bone-marrow the transparent forms are in excess, in the spleen the transitional forms. The small transparent forms are found particularly in the marrow. The multinuclear leucocytes may be found in cover-glass specimens from the spleen, marrow and glands, more markedly in the spleen and marrow than in the glands. But on section, Uskow finds multinuclear forms only in the blood-vessels. In the living rabbit, pieces of marrow, spleen, mediastinal glands, and also a piece of the portal vein, which was included between two ligatures, were placed

in Fleming's solution, cut and stained ; and nowhere, excepting in the blood, were found multinuclear leucocytes. Hence Uskow concludes that either in the blood or in the tissues, the multinuclear forms arise from the mononuclear. They arise probably, he thinks, from the large transitional corpuscles. The smaller size of the multinuclear element may, he believes, be due to the condensation of the nucleus. In other words, Uskow believes that the small and large lymphocytes and the small transparent leucocytes are the youngest elements in the blood. They, by their growth in protoplasmic richness, their diminution in affinity for coloring matters on the one hand, and their increase in affinity for coloring matters on the other hand, merge into a common, indistinguishable variety, the transitional forms, changing in their further progress into the multinuclear neutrophilic cells. This, he considers the last stage of development, and the multinuclear neutrophilic leucocyte he traces through various degenerative processes to its final dissolution.

Uskow thus classifies the leucocytes :—

(a) Young elements.

(1) Small transparent leucocytes.

(2) Small lymphocytes.

(3) Large lymphocytes.

(b) Ripe elements.

(4) Small transitional leucocytes.

(5) Large transitional leucocytes.

(6) Giant transitional leucocytes.

(7) Large transparent leucocytes.

(8) Giant transparent leucocytes.

(c) Over-ripe elements.

(9) Multinuclear leucocytes.

(10) Eosinophilic leucocytes.

This classification seems rational. A careful study of the blood with the triple stain cannot fail to impress one with its objective accuracy.

Tschistowitsch divides the leucocytes into the following classes :—

(a) Young elements, after Uskow.

(1) Small lymphocytes.

(2) Large lymphocytes.

(3) Small mononuclear leucocytes. Here he includes leucocytes of the size of a large lymphocyte or somewhat larger, with a round or ovoid nucleus, which stains more feebly than in the lymphocytes, and with a more developed protoplasm, which stains either very feebly (the small transitional forms of Uskow) or not at all (the small transparent forms of Uskow.)

(b) Ripe elements which differ from the small mononuclear leucocytes only by their greater dimensions.

(4) Large mononuclear leucocytes.

(5) Mononuclear leucocytes with an indentation in the nucleus. They are distinguished from large mononuclear leucocytes only by the indented form of the nucleus. In this group he includes also those rather unusual multinuclear leucocytes without a trace of granulation, with an uncolored or a very slightly staining protoplasm. These latter, he thinks, are probably a transition form between those with a single indented nucleus and the multinuclear neutrophils (?).

(c) Over-ripe leucocytes, after Uskow.

(6) Multinuclear neutrophilic leucocytes.

(7) Eosinophilic leucocytes.

This division differs from the last which was advised by Uskow only in that he places the small transparent leucocytes and the small mononuclear leucocytes with but slightly stained protoplasm in the same group, because he could distinguish no essential difference between these two.

These various elements exist in normal blood in certain fairly definite proportions one to another. If we make a differential count according to Ehrlich's classification, we find: lymphocytes, 15 to 25 per cent.; mononuclear and transparent forms, about six per cent.; polynuclear, 70 to 75 per cent.; eosinophiles, one to five per cent.

Taking Uskow's estimates that in a healthy man there should be about

18 per cent. of the young, six per cent. of the ripe, and 75 per cent. of the over-ripe elements, we see that in Uskow's more minute classification the class of young elements corresponds fairly accurately to the lymphocytes in the classification of Ehrlich and his students; the class of ripe elements to the large mononuclear and transitional forms; and the class of the over-ripe elements to the neutrophiles and eosinophiles.

For minute, accurate work the classification of Uskow seems to be unquestionably the best that has yet been made. The modification of Tschistowitsch, in which he includes under the small mononuclear the small transparent forms and the small transitional forms, and classes the other elements as large mononuclear, without distinction, is perhaps more simple and nearly as satisfactory. In ordinary clinical work, however, one can expect to do little more than to count the divisions into:—

(1) Small mononuclear leucocytes, including the small and large lymphocytes the small transparent forms, and possibly some of the small transitional forms of Uskow.

(2) Large mononuclear and transitional (indented) forms.

(3) The multinuclear neutrophiles.

(4) The eosinophiles.

Most of the counts which I have made in my own work, before I was familiar with Uskow's classification, have been on this basis, and have included under lymphocytes or small mononuclear elements almost exactly those elements which Uskow and Tschistowitsch have included under their young elements; and under the large mononuclear and transitional leucocytes just those forms which he has included under his ripe elements.

There is one point in these classifications with regard to which there will always be some differences, depending on the individual who makes the estimations; that is, the point where the small mononuclear elements end and the large begin.

Now what practical information can we gain from the study of dried specimens?

(I) The red corpuscles. The skilled observer can readily detect a diminution in number by the behavior of the drop of blood, and the thickness of the corpuscles on the slide (if he prepare the specimen himself). A marked deficiency in color may be detected by the increased pallor of the middle of the corpuscles; that is, the point of greatest biconcavity is much more marked than in normal blood. Different stains, of course, give different appearances, but one who is familiar with the stain he is using can readily detect these points. Any difference in size or shape (poikilocytosis) of the corpuscles is readily observed.

Nucleated red corpuscles are particularly well seen; there is no method by which they are so readily brought out. Two varieties of these elements are seen in the human blood:

(a) In all acute anæmias of any intensity, and in almost all of the more chronic secondary anæmias, as well as in the so-called essential blood diseases, one finds bodies about as large as an ordinary corpuscle, containing a small, round, intensely staining nucleus, which has a peculiar refraction. This nucleus may be seen in the middle of the corpuscle, towards its edge, protruding from the corpuscle, or again free in the blood current, suggesting very strongly that this is probably the normal manner in which the red corpuscle parts with the nucleus which belongs to it in its youngest stages.

(b) In some grave anæmias, particularly in progressive pernicious anæmia, and the leukæmias, one finds elements much larger than these, containing large, much more palely staining nuclei, the body of the cell taking a stain similar to that of the ordinary red corpuscle. With the proper technique a well-marked nuclear network may be made out in these cells while the nuclei of the smaller

variety show only a diffuse stain. Karyokinetic figures may often be found in the nuclei of these large elements, particularly in some forms of leukæmia. At times one finds these large nucleated red corpuscles where the nucleus has the same intense stain that it takes in the younger forms, but where it is apparently breaking up or is represented only by several small fragments. The process of extrusion of the nucleus in these large forms is more rarely observed. This has led Ehrlich to believe that what he considers the normal process of parting with the nucleus (extrusion) does not take place in some of the more grave anæmias, but that the nucleus becomes fragmented, and absorbed, as it were by the cell itself. Ehrlich, with Rindfleisch, is of the opinion that in the normal process of blood degeneration the extruded nucleus develops about itself a second corpuscle, and, being extruded again, the same process may go on for a considerable time. If one accepts this idea, which is certainly rather hard to believe, it is easy to conceive that the process of absorption of the nucleus would represent a much less satisfactory and active method of blood regeneration.

The smaller variety, that is to say, the normal variety of nucleated red corpuscles Ehrlich calls *normoblasts*, the larger, *megablasts* or *gigantoblasts*. The fact that one observes in some of these large nucleated red corpuscles, particularly in some leukæmias, unquestioned signs of karyokinesis is, it seems to me, reasonably good evidence that they are not all, to say the least, degenerate forms, but perhaps in some instances earlier forms of red corpuscles than one ordinarily sees in the blood.

In an anæmia of any particular degree one may also observe red corpuscles which take up, in addition to the acid coloring matters, a certain amount of basic stains, that is, which show, with the eosin-methylene blue

stain, a bluish-purple color, while others show throughout their substance small spots and indications of a network of bluish stain. These forms Ehrlich considers degenerative. He believes that the process taking place within them is akin to coagulative necrosis. Gabritschewski is inclined to believe that these elements are rather young than degenerate forms, from the fact that he has found certain nucleated red corpuscles which show this same characteristic stain. Ehrlich, however, remarks that this is only true of the nucleated red corpuscles of the second class, the *gigantoblasts*, particularly those in which the nucleus is fragmented. He asserts, moreover, that corpuscles with affinity for basic stains may be found in the blood of acute anæmias before regenerative forms appear, while they are found in considerable numbers in the blood of starving animals where there is no sign of regeneration. They are clinically, of course, found in association with what we consider regenerative forms (nucleated red corpuscles). Ehrlich well speaks of "Der haupt Charaktere des anæmischen Blutes, das Ineinandergreifen von degenerations und regenerations Formen."

(II) The colorless corpuscles. With stained specimens information can readily be gained with regard to the number and the varieties of the colorless elements. There is no method by which so careful a differential analysis can be made. The occurrence of a leucocytosis can be made out almost as satisfactorily by the practised eye as by counting the corpuscles. Under the term leucocytosis I shall understand, in the sense of Ehrlich, an increase in the total number of leucocytes where the differential count shows only a marked increase in the percentage of the multinuclear neutrophils at the expense of the small mononuclear leucocytes.

(To be continued.)

Medical and Surgical Progress.

THE ETIOLOGY AND CLASSIFICATION OF INFECTIOUS DISEASES.

Surgeon-General Sternberg, in the West-ley Carpenter Lecture, delivered before the New York Academy of Medicine, November, 1896, discusses this subject rather fully. We abstract the following paragraphs:—"The additions which have been made to our knowledge relating to the etiology of infectious diseases during the past thirty years are generally recognized as constituting a substantial basis for scientific medicine. We are not yet entirely released from the trammels of unsupported theories and traditions, but the sun of science is already approaching the horizon, and gives light enough to enable us to perceive a broad and attractive landscape, a portion of which is still obscured by shadows which will no doubt soon be dissipated by the advancing source of light and life. Those of us who were graduated prior to the dawning of this new light are best able to appreciate the importance of the recent additions to our knowledge in this fundamental department of medicine. I confess that etiological studies have always had a special attraction for me; and it has seemed to me that a general review of the evidence relating to the infectious diseases might not be out of place on the present occasion. The facts which I shall present will not, of course, have the charm of novelty, since those who constitute my audience are physicians who have no doubt kept pace with the progress of discovery in this field of investigation.

It is hardly necessary to say that by "infectious diseases" we mean those diseases which result from the introduction into the body of some disease-producing agent. And I think we are justified in saying that an essential condition of infec-

tion is that the disease-producing agent shall be capable of reproduction in the body of the infected individual; in other words, that it is a living organism. It matters not whether this living organism is large or small; whether it belongs to the animal or vegetable kingdom, whether it is located in the skin, as in scabies; in the muscles, as in trichinosis; in the lymphatics, as in erysipelas; in the solid viscera, as in amoebic abscess of the liver; in the intestine, as in cholera; or in the blood, as in relapsing fever: the introduction and multiplication of the living infectious agent constitute infection."

He then proceeds to show that many diseases formerly included among "idiopathic" affections are now properly considered as infectious diseases, and that "an 'idiopathic inflammation' of skin, mucous or serous membrane, or visceral parenchyma is something which modern pathologists find it more and more difficult to believe in." He further calls attention to the fact that while infectious diseases require the presence of a specific pathogenic organism for their development, there must co-exist a susceptibility to the disease on the part of the person invaded, the micro-organism, however, being the chief etiological factor. He then speaks of some of the causes that seem to render persons more susceptible to infection. In speaking of the seasonal prevalence of certain diseases he takes occasion to say: "The seasonal prevalence of certain diseases is due to the fact that the specific infectious agent multiplies external to the bodies of infected individuals when conditions as to temperature, moisture and organic pabulum are favorable for such multiplication. The epidemic prevalence of yellow fever, of cholera and of various forms of intestinal flux during the summer

months and the autumnal epidemic of malarial fevers in regions favorable for the development of the malarial parasite, are no doubt to be accounted for in this way. On the other hand, certain diseases, in which there is no evidence that the specific infectious agent is capable of multiplication outside of the bodies of infected individuals, are most prevalent in winter, because conditions are then more favorable for their communication from individual to individual. This is true of those infectious diseases which are communicated by personal contact ("contagious diseases"), such as small-pox, measles, scarlet fever, whooping-cough, influenza, diphtheria, etc. Evidently conditions which bring those already infected in close personal contact with healthy individuals, at a time when doors and windows are closed to exclude the cold air, will favor the extension of these diseases. In cities a notable increase in the prevalence of diphtheria and scarlet fever has been observed when the public schools were opened in the autumn. The increased prevalence of influenza and diphtheria during the winter and spring is due not only to the influence of exposure to cold as a factor in developing an attack, but also to the intimate association of those already infected with healthy individuals. This occurs in schools, churches, factories and private dwellings, and fully accounts for the rapid epidemic extension of influenza in towns and cities. It is somewhat remarkable that the extension of this disease from individual to individual by personal contact, is not recognized by the public generally, and is still denied by a considerable number of physicians. As a matter of fact the specific infectious agent has been known since 1892, when it was discovered by Pfeiffer in the purulent bronchial secretions of influenza patients, in which it is found in vast numbers. This secretion is just as much infectious material as is the false membrane of diphtheria or the contents of small-pox pustules—each being able to reproduce its kind when

introduced into the body of a susceptible individual. And if an influenza epidemic is developed more quickly than an epidemic of diphtheria or of small-pox, this is chiefly due to the fact that the period of incubation is short, and that no quarantine precautions are taken. The influenza patient receives his friends while confined to his room, with an unconscious disregard of the fact that he is exposing them to an attack of the infectious disease from which he is suffering; and when able to go out he or she may be seen at theatres, teas, balls, dinners and public gatherings of all kinds, naively announcing to friends that he is just recovering from a severe attack of the grippe, and from time to time coughing up a little bronchial mucus loaded with influenza bacilli." He combats the idea of a wide contamination of the atmosphere with infection, or that it is carried to any great distance on currents of air. He calls attention to the germicidal action of sunlight, to dilution and desiccation as preventives of the widespread of infection. On the question of transmission he says: "The facts which have been developed with reference to the transmission of cholera and typhoid fever, considered in connection with numerous recorded observations relating to the supposed development of malarial fevers as a result of drinking surface-waters, have led some authors to the conclusion that malarial infection, also, commonly results from the introduction of that malarial parasite in this way. Without denying that this may occur I am disposed to believe that much of the evidence which has been advanced in favor of this view is unreliable. In many cases the so-called malarial fevers which have been traced to the use of surface-water from wells, streams, etc., have been of a "continued type" and not controlled by quinine. In the absence of positive evidence of the presence of the malarial parasite in the blood, continued or remittent fevers which resist the specific action of quinine cannot, in our opinion, be pro-

perly classed with the malarial fevers. If not due to infection by the typhoid-bacillus, they are, at least, more nearly allied to typhoid than to the typical malarial fevers."

* * * *

"In cholera and typhoid fever the mode of the propagation is no longer a mystery. The researches of bacteriologists have demonstrated the biological characters of the pathogenic bacteria which are concerned in the etiology of those diseases, and the fact that they are found in the alvine discharges of the sick. The channel of infection is now generally recognized by physicians and by sanitarians, and it is unnecessary to attempt at the present time to support by evidence the statement that infection usually occurs from the use of water or food contaminated by the specific germs of the disease in question. But there is another epidemic disease which has many points in common with these two, in which there is no evidence that infection occurs in the same way, and in which apparently it does occur through the respiration of an infected atmosphere. The disease referred to is yellow fever. Even more decidedly than in the case of cholera and typhoid fever the epidemic prevalence of this disease depends upon insanitary local conditions and an elevated temperature, such as is most favorable for the rapid development of micro-organisms. Unfortunately all researches made for the purpose of discovering the deadly germ of this pestilential disease have hitherto been unavailing. The writer has been led to believe that, as in cholera and in typhoid fevers, the germ is present in the alimentary canal of infected individuals; and that when material containing it is thrown out in localities where the proper pabulum exists for its development, under favorable conditions as to temperature and moisture, it multiplies abundantly, establishing rapidly extending foci of infection. Susceptible persons visiting such localities contract yellow fever, and there

is no satisfactory evidence on record showing that infection occurs from the ingestion of water or food contaminated with infectious material.

The inference, therefore, appears to be justified that the disease is contracted by respiring an infected atmosphere. But this inference may eventually turn out to be a mistaken one, although many facts could be given which seem to support it. It will be observed that in this case the supposed infection of the atmosphere is of limited extent, and depends upon a continuous supply of the infectious elements from the telluric foci from which these are believed to be given off. The mode of infection, therefore, would correspond with that which occurs in the malarial fevers when these are contracted by breathing the air from marshy places, and would give no support to the idea that the epidemic prevalence of such diseases as cholera, influenza, etc., may be due to a general contamination of the atmosphere of a town or of a section of country, or that there is any substantial basis for the "pandemic wave-theory" which was advanced by some of the older writers upon epidemiology. There is a way by which pathogenic bacteria may be carried a limited distance through the air, and by which infectious material may be conveyed from house to house, from a privy-vault to the beefsteak upon the kitchen-table or to the milk-jug, which should not be lost sight of in considering channels of infection. This is upon the feet of insects, and especially of house-flies, which, as is well known, frequent all kinds of decomposing animal material and swarm upon the surface of fecal matter deposited upon the surface of the ground or in the shallow pits. There are many facts which support the view that such material affords a suitable nidus for the development of the yellow fever germ, and I am strongly inclined to believe that the ubiquitous house fly is a factor of considerable importance in the propa-

gation of yellow fever, typhoid fever and cholera."

* * * *

"It has also been suggested that the mosquito may give rise to material infection by introducing the malarial germ through the puncture it makes for the purpose of obtaining the blood of its victim. But I know of no exact observations or experimental evidence in support of this hypothesis. There are, however, some reasons for believing that the mosquito may play a part in the etiology of malaria in the way suggested by Manson, *i.e.*, as the agent by which the parasite is withdrawn from the blood of infected individuals and returned to its normal habitat outside of the body to complete its life history. We have an analogy for this in the part played by the mosquito in withdrawing embryo filariae from the blood and returning them to the stagnant pools frequented by the insect.

Manson says, in discussing this hypothesis in his *Gulstonian Lectures* (1896):—

"We can readily understand how the mosquito-bred plasmodium may be swallowed by man in water as so many disease germs are, and we can readily understand how it may be inhaled in dust. Mosquito haunted pools dry up. The plasmodia in the larvae and those that have been scattered about in the water finding themselves stranded by the drought, and so placed in a condition unfavorable for development, pass into a resting stage, just as they do when by quinine or other means man is rendered temporarily unsuited for their active life. They may, probably do, become encysted, as so many of the protozoa do in similar circumstances. The dried sediment of the pool, blown about by winds and currents of air, is inhaled by man, and so the plasmodium may find its way back again to the host from whom its ancestors had, perhaps, started generations back."

This theory appears plausible; but we

find it difficult to believe that man is essential for the completion of the life cycle of the plasmodium, for the most concentrated and deadly malarial emanations may be given off from marshy places which are far removed from the haunts of man. It may be, however, that the mosquito is an essential factor in the development of the plasmodium, and that man, instead of being a necessary intermediate host, only serves occasionally, and in a certain sense accidentally as such. Perhaps other mammals or birds may serve the same purpose. It has frequently occurred to the writer that the malarial plasmodium, like other amoeboid protozoa, may find its normal habitat, external to the bodies of its insects or animal hosts, upon the stems and the leaves of water plants rather than in the water itself. The fact that malarial fevers do not prevail in the vicinity of swamps, when the marsh vegetation is submerged by high water, is in favor of this view; as is also its apparent need of plenty of oxygen, which we infer from its active multiplication in the blood and its parasitic invasion of the red blood corpuscles."

He calls attention to other diseases that are transmitted by insects, notably Texas fever in cattle and the African fly disease transmitted almost entirely by the bite of the tse-tse fly. "The essential factors in the etiology of an infectious disease, therefore, are a susceptible individual and a specific infectious agent capable of reproduction in the body of such individual."

* * * *

"My discussion of the classification of infectious diseases is undertaken without any expectation of offering at the present time a satisfactory scientific classification, but rather as showing the difficulties attending such an attempt in the present state of knowledge. That a scientific classification of diseases should be based upon etiology is generally admitted, and we have to-day a great advantage over our

predecessors as regards the data for such a classification. Still our knowledge is incomplete in many directions, and we are yet in doubt as to whether certain diseases should be included among the infectious diseases or not. The tendency of modern science has been, however, to add constantly to the list of diseases of this class. It is less than fifteen years since Koch published his discovery of the tubercle-bacillus; the tetanus-bacillus was discovered in 1884, the bacillus of influenza in 1892. To-day we are discussing the propriety of transferring acute rheumatism to the list of infectious diseases. To-morrow we may be able to include cancer in all its varieties."

* * *

"This brings us to speak of a classification based upon the mode or channel of infection. From this point of view we may have: (a) Traumatic infections; (b) infection by contact (direct contagion); (c) infection through ingesta; (d) infection through the respiratory tract. Under the heading "infection by contact"; (b) we would have to include venereal diseases and contagious skin diseases. To what extent the eruptive fevers are contagious in this sense it is difficult to say. To transmit small-pox or vaccinia by way of the skin a traumatism is considered necessary—vaccination or inoculation; and it is probable that infection in the eruptive fevers usually occurs through the deposit of infectious material suspended in the air upon the respiratory mucous membrane rather than through the unbroken skin. Scarlet fever and measles may also be transmitted by inoculation, and there is ample evidence that the first mentioned disease may be transmitted through ingesta, especially milk. Typhoid fever, cholera, amoebic dysentery, cholera infantum, trichinosis, etc., are contracted by the introduction into the alimentary tract of the ingesta containing the infectious elements to which they are due. Diphtheria, epidemic in-

fluenza, mumps, whooping-cough, measles and pulmonary tuberculosis are probably contracted through the deposit upon the respiratory mucous membrane of the specific infectious elements to which they are due. Pneumonia, pleurisy, peritonitis, meningitis, bronchitis and suppurative traumatic infections generally are due to micro-organisms which habitually lead a saprophytic existence upon the surface of the body or upon exposed mucous membranes; they are therefore commonly due to autoinfection.

Another method of classification which presents certain advantages is one based upon the nature of the infectious agent. This would give us the following principal groups:—

I. Diseases due to infection by vegetable parasites: (a) schizomycetes (bacteria); (b) hyphomycetes (microscopic fungi); (c) blastomycetes (yeasts).

II. Diseases due to infection by animal parasites: (a) protozoa; (b) nematodes; (c) trematodes; (d) cestodes; (e) acari.

Since the discovery of the tubercle-bacillus and the introduction of Koch's method for the isolation and cultivation of bacteria by means of solid culture-media, the progress of our knowledge relating to the bacteria (Group I, a) has been very rapid, and while we have still, no doubt, much to learn about pathogenic bacteria, it is probable that few if any first class discoveries in the etiology of infectious diseases remain for the bacteriologists. The infectious diseases due to micro-organisms of this class may be classified as follows: (a) General blood infections, including relapsing fever, anthrax, septicaemia of cattle (Rinderseuche), etc.; (b) localized infections, acute or chronic, including erysipelas, diphtheria, influenza, croupous pneumonia, bronchitis (?), gonorrhoea, cystitis, pyelonephritis, endometritis, conjunctivitis, otitis, ozoena, pleurisy, peritonitis, pericarditis, meningitis, endocarditis, abscesses, furuncles, adenitis, mastitis,

osteomyelitis, enteritis (?). Asiatic cholera, cholera, cholera nostras, cholera infantum, non-amoebic dysentery (?), typhoid fever, tuberculosis, glanders, rhinoscleroma, bubonic plague, chancre, tetanus, malignant oedema, etc.

The second group (*b*) of infectious diseases due to vegetable parasites includes: Actinomycosis, mycetoma or Madura foot, the various forms of tinea (trichophyton, imbricata, versicolor, favosa), erythrasma, pinta (the spotted skin disease of Mexico) etc.

Recent researches indicate that the blastomycetes (*c*) may, perhaps, play a more important rôle in animal pathology that has been heretofore suspected. Busse, in 1895, obtained from a case of chronic pyaemia a yeast which proved to be pathogenic for mice, and during the past two years several investigators (Sanfelice, Kehane, Curtis Corselli and Frisco, Pianese, Roncali) have obtained pathogenic blastomycetes, by cultivation from malignant tumors. *Oidium albicans*, which is recognized as the usual cause of aphthous ulcers in the mouth, belongs to this group.

In the second group (II), which includes infectious diseases due to animal parasites, especial interest attaches to the subgroup *a*—protozoa. The diseases which have been shown with a great degree of probability to belong to this group are the malarial fevers, amoebic dysentery, the surra cattle disease of India, the tse-tse "fly disease" of Africa and the "Texas fever" of American cattle. But these, I anticipate, are only the first discoveries in a very promising but difficult field of investigation. The presence of a vitiated amoeboid micro-organism in the mucons secretion coughed up by children suffering from whooping cough has recently been reported by Deichler (1886) and by Kourlow (1886).

* * * *

Finally, we may base our classification upon the special tissues or organs involved

in the infectious process. From this point of view we have:—

I. General blood infections (septicaemia), including malarial infection, relapsing fever, streptococcus infection, etc., in man; and anthrax, swine plague, cattle plague (Rinderpest), Texas fever of cattle, etc., in the domestic animals.

II. Localized infections: (*a*) Of the integument and subcutaneous connective tissue, including scabies, the dermatophyti, erysipelas, furuncles, etc.; (*b*) of mucons membranes, including diphtheria, influenza, glanders, bronchitis, rhinitis, conjunctivitis, otitis, gonorrhoea, cystitis, enteritis (?), cholera Asiatica, cholera nostras, etc.; (*c*) of serous membranes, including pleuritis, pericarditis, peritonitis, meningitis and synovitis; (*d*) of glands, including typhoid fever, bubonic plague, parotitis, mastitis, adenitis, etc.; (*e*) of the lungs, including pulmonary tuberculosis, croupous pneumonia, etc.

It is evident that under several of the sub-divisions the diseases mentioned would require a sub-heading to designate definitely the nature of the infectious process. Thus we would have, for example, to specify whether a peritonitis was tubercular or due to streptococcus infection or to some other known micro-organism; an adenitis might be due to syphilitic or tubercular infection or to one of the pus-cocci; a conjunctivitis to gonococcus infection or to some other pathogenic micro-organism, etc.

It will be noted that, both in our classification based upon the nature of the infectious agent and in that based upon the special tissues or organs involved in the infectious process we have not included the eruptive fevers. It is hardly necessary to say that this omission is due to the fact that we have as yet no positive knowledge to guide us in placing these infectious diseases in the systems of classification suggested, which are, therefore, necessarily incomplete.—*American Journal Medical Science.*

ANTIPYRINE IN INFLUENZA.

Unless there are any contraindications to its employment, such as old age, vascular derangement, etc., antipyrin still remains one of the most pleasant and rapid remedies for obtaining relief from the symptoms of influenza. Much depends on how it is exhibited; the most common mistake being to give too large doses and at too long intervals. By using the following formula relief is speedily secured, and any depressing effects of the drug are protected against:—

℞ Antipirinæ, gr. v.
Sodæ Bicarb, gr. v.
Spirit Ammon. Aromat., m. x.
Elixir Simpl, dr. ss.
Tinct. Opil., m. ij.
Aq. Anethi ad. oz. ss.

M. S.—One tablespoonful every half-hour for three doses, then every two hours, every three hours, and afterwards every four hours if still required.

This is a digestible form, and not depressing. The combination of a small dose of laudanum rapidly removes the depressing symptoms, and appears to prevent nervous prostration afterwards.

ANTISEPSIS OF THE MOUTH AND THROAT.

Rosenbach's directions cannot be improved upon. "The less solid food taken the greater should be the care with the mouth. It should be rinsed out several times a day with luke-warm water, containing a little common salt and Tincture of Myrrh or Eau-de-cologne. With bleeding of the gums or bad teeth powdered Boric Acid may be twice daily rubbed between the lips and gums. False teeth should be removed when no solid food is taken. In patients with partial loss of consciousness the mouth should be examined frequently for small sores, which, if present, should be powdered with a little boracic acid; and cracks at the corners of

the lips heal quickly if dried with a clean towel and treated with boric acid or vaseline."

In ulcerative stomatitis and noma nothing answers better than the frequent application of solution of Mercuric Perchloride (1 in 1000).

Among other antiseptic mouth washes may be mentioned solutions of Sodium Hyposulphite (3 grs. to the ounce), Borax and Carbolic Acid (3—5%, applied with a brush). Liq. Sodæ Chlorinatæ (oz. i. to the pint of water) is efficient, but very unpleasant to taste. One of the most useful medicines for internal use in all forms of septic inflammation of the mouth and throat is the following:—

℞ Liq. Hydrarg. Perchlor, dr. i.
Potass. Iodidi, gr. ii.
Tinct. Myrrhæ, m. x.
Aq. Destillat ad. oz. i.

Dose—1 to 4 teaspoonfuls every two to four hours, in small sips.

In the application of antiseptic solutions to the mouth and throat all mucus should be previously removed as far as possible by rinsing or swabbing with lime water, or other weak alkaline wash.

ANÆMIA PERNICIOSA.

Stengel advises that under no circumstances should arsenic be pushed so far as to produce diarrhœa or other gastro-intestinal symptoms, as the loss of ground from an attack of diarrhœa may more than counterbalance the gain secured by weeks of judicious treatment. The tolerance of the drug is sometimes remarkable, but there is little need of increasing the dose beyond 15 drops, even when it is well borne.

The patient should always at first be confined to bed, and should be required to use the bed-pan and urinal. The diet should be nutritious and easily assimilable. Meats should not be given too freely, on account of the diminished secretion of hydrochloric acid; nor, on the other hand, should

sugars or starchy food be allowed in large quantity, from their tendency to fermentation. Symptomatic treatment is generally required to aid digestion and to allay gastric irritation. For the former purpose hydrochloric acid is often essential, and should always be tried where gastric fullness and fermentation are complained of. Where vomiting is severe small doses of bismuth subnitrate (5 grains) with cocaine ($\frac{1}{15}$ to $\frac{1}{12}$ grain) act more happily than any other remedies; and it has seemed that arsenic could be administered more freely and continuously with than without these adjuvants. They are best administered some time before the meal.

Lavage may prove of great advantage in controlling obstinate vomiting and in improving digestive power. In cases where gastric atony seems prominent and the patient's appetite is poor, bitters may be given with advantage before meals.

Intestinal lavage has been less frequently practised, and has not as yet yielded definite results. The use of intestinal anti-septics, such as salol, naphthol and carbolic acid has been highly lauded, but the results are thus far uncertain. Free use of purgatives is distinctly less advisable than in chlorosis, excepting in the cases of parasitic pernicious anæmia. Enemata or suppositories will generally be sufficient for the purpose of securing action of the bowels, and beyond this we should not attempt to go.

Sooner or later in pernicious anæmia there comes a time when remedies seem altogether powerless.

At this stage measures directed to assist the circulation are even more essential than arsenic, and of these not the least powerful is systematic massage. A still more advanced case would call for injections of water or of blood. The safest and perhaps the best method would be the hypodermic injection of normal salt solution in large quantities (2 pints to 2 quarts). The transfusion of blood itself has been practised by a number of investigators, and some, as Bra-

kenridge, report remarkable improvement following the operations. It is doubtful, however, if blood-serum or blood has any great advantage over salt-water, and certainly the danger of fibrin-ferment intoxication and other accidents would militate against their use.

During convalescence iron is a valuable adjuvant to arsenic. In the earlier stages of the disease, however, it is not only of no value, but often disagrees decidedly.

A STUDY OF THE PARASITES OF MALARIA.

By GEO. W. BURLEIGH, M.D.

The fact that malarial diseases show themselves in so many varied clinical features, renders important the publication of all cases that are studied in the light of modern methods. It is now a recognized fact that malaria in all its varied forms is always an infection of blood by an organism known as the *plasmodium malariae*.

In November of 1880 A. Laveran, a French army surgeon, announced to the medical world the discovery of the parasites in the blood of malarial patients. Since that time there have been many conflicting statements written on the etiology of malaria, especially so in regard to the classification of the different parasites. While we cannot accept all that has been written by Laveran, who gave a most vivid and elaborate description of his observations, we find much in his early writings, which is invaluable to those who would follow the development of a line of study which has now progressed to such perfection, that all who have had the necessary training and material are unanimous in the statement that these bodies are always in the blood of patients suffering from malarial fever. While we do well to read all that has been written on this subject it is far more valuable to those who wish to know for themselves, to follow the good advice of Prof. Dock, of the University of Michigan,

to a junior medical student, who was anxious to make a study of malaria. In reply to the question as to what was the best and most modern work on the subject he was told to procure a microscope, 1-12 oil immersion, cover-slips and slides, and a patient suffering with malaria, and to make a thorough study of his blood and associate his results with the symptoms of the patient.

We refer the reader to such standard works as "The Parasites of Malarial Fevers," New Sydenham Society, London, and "The Malarial Fevers of Baltimore," the John Hopkins Press, Baltimore, for a full discussion of the subject.

It was Laveran who first discovered a sure means of diagnosing malarial fever, and it is to him we owe our thanks for his long-continued research covering a space of some five years while busily engaged in the duties of a military surgeon at Constantine, Algiers. We also owe much to the young Roman school for their earnest researches by the use of stained preparations.

Klebs-Tommasi-Crudeli bacillus malarie had become an established fact among the greater number of investigators. About this time Marchiafava and his pupil, Celli, were busily engaged in a serious research on the same subject, but, like Laveran, they worked under difficulties. Laveran worked with a small magnifying power (400-500 diameters), while Marchiafava up to 1883 used a lens belonging to the dry system. From this date to 1884 he made his observations on dried specimens with a 1-12 oil immersion lens, Zeiss.

In 1884 he began the study of malaria in freshly drawn blood. Since then he has continuously progressed in his researches, placing before the medical profession most valuable information.

It was Marchiafava and Celli who first advocated the theory that the reproduction of the malarial parasites depends upon the segmental bodies, and thus for the first

time we have a clear and minute description of the development of these organisms.

To Golgi belongs the credit of differentiating between the different types of fever by the different organisms found in the blood. In 1886 he also clearly established the fact that synchronous with the paroxysm we have associated the stage of sporulation. Since that time there has been a comparatively large number of investigators in different parts of the world.

Among those who have contributed most valuable information with reference to the diagnostic value of the organisms, and who have also given us a better classification of the parasites, may be mentioned (in order of the their appearance in print) Sternberg, Osler, Danilewsky, Councilman, Chenziinsky, James, Maurel, Plehn, Dock, Quinke, Von Jaksch, Bignami, Mannaberg, Thayer, and Hewetson.

Species of Parasites and Fever Types.

On this point there are two distinct views held:—

The one party, Laveran being its champion, claims that the malarial parasite is an individual species and that the different types are brought about by polymorphism.

The other party, which may be known as the Italian party, holds that the unpigmented amœboid organism grows and develops through successive stages till the organism has reached maturity, and then, closely following this stage, sporulation takes place.

The flagellated and crescentic parasitic varieties, they hold to be sterile forms, and have nothing to do with the rise or fall of the temperature.

The following illustrates in brief the position held by the Italian school:—

Type of Fever:—Can be ascertained by the species of parasite found in the blood.

Quartan.—Only and alone by one generation of the quartan parasite.—(Golgi.)

Tertian.—1. By one generation of the tertian parasite. (Golgi.) Light form of tertian fever.

2. By one generation of the malignant tertian parasite. (Marchiafava and Bignami.)

Quotidian.—1. By one generation of quotidian parasites. (Marchiafava and Celli.)

2. By two generations of tertian parasites (with a 24-hour interval.)

3. By three generations of quartan parasites (with a 24 hour interval.)

Continuous Fever.—1. By several generations of quotidian parasites.

2. By several numerous generations of quartan and tertian parasites (very rarely from malignant tertian parasites.)

Irregular Fever.—1. By several generations of quotidian parasites.

2. By several generations of quartan and tertian parasites which do not stand in a 24-hour interval to one another.

3. By the presence of several species (for example, tertian parasites and quotidian parasites of one or more generations); also by mixed infections.

Methods of Procedure.

Time.—The examination of blood should be made with reference to the temperature curves, as the plasmodia are most plentiful and have reached their maximum size at the time the temperature begins to rise. If the blood be examined three or four hours after the temperature begins to rise, some of the most brilliant forms can be seen.

Material.—A microscope with a 1-12 oil immersion and a No. 3 or No. 4 eye-piece, No. 1 extra thin $\frac{3}{4} \times \frac{3}{4}$ cover-slips, slides and forceps for handling the slips. The cover-slips should be prepared after one of these methods:—

First, allow them to remain in strong sulphuric acid for two hours. Wash in flowing water till free from acid, then place in glacial acetic acid for one hour. Wash in water as before, and place in alcohol 95 per cent. They may now be wiped with a cloth free from lint, and put in a dirt-proof box.

The slides may be washed in alcohol and dried as above.

After having thoroughly cleansed the tip of the finger, the blood is withdrawn by a prick of the lancet. The first drop is smeared over the finger, thus forming a coat of serum. The drop should be very small. Then lightly bring the drop of blood in contact with the center of the slip, which is quickly transferred to the previously prepared slide and allowed to spread out, and then take at once to the microscope.

In order to secure good, dry preparations, the drop of blood should also be small. Holding in your left hand a clean cover-slip with a pair of Ehrlich's forceps, secure the blood and touch it with the edge of a cover-slip held in the right hand by a pair of forceps, and quickly but firmly draw it over the cover-slip held in the left hand. Practice and care are needed, so that each corpuscle on the cover-slip in the left hand will lay flat, presenting its full surface to the observer. Allow the slip to dry thoroughly.

After properly fixing the specimen in a solution composed of three parts of ether to one of absolute alcohol, the specimen is ready for staining.

First, stain in Eosin, 1 per cent solution in 60 per cent alcohol, for 45 seconds, wash, and dry between filter papers. Counter-stain in Löffler's alkaline methylin blue for three minutes. Wash and dry thoroughly, and then examine in water, and if properly stained, mount in Canada balsam. The plasmodia will be stained blue and the pigment of the plasmodia, Van Dyke's brown. The red blood corpuscles will appear red.

REMARKS ON MILK DIET IN THE SEVERE INTESTINAL DISEASES ACQUIRED IN THE EAST.

By GEORGE THIN, M.D.

During a long experience of the management of certain climatic disorders of the intestine by exclusive milk diet, my attention has been much directed towards

minimizing the difficulties inseparable from the treatment. Many persons have a strong dislike to milk, and I am often met by the statement that the patient "has never been able to take milk in his life." One sufferer from a severe form of psilosis prefaced her statement of her case by telling me: "It is no use prescribing milk for me. I can neither take it nor digest it. All the medical men whom I have consulted have soon satisfied themselves that this is correct, and have been obliged to give me something else." For cases like that one, I have found the use of aerated milk of inestimable value. So far, I have only twice failed to succeed in getting a patient to go on exclusive milk diet. In one case, which was neither severe nor well marked, the diarrhœa did not rapidly yield, and the treatment was abandoned after a short trial; and another patient, who was doing extremely well, gave it up for, I am afraid, no better reason than caprice, with disastrous results.

Another, and sometimes a serious difficulty in connection with milk diet, is the quantity of fluid which the patient must swallow. Many patients, especially when convalescing, take as much as six to eight pints daily, and even more, without any difficulty, but there are others in whom the necessary quantity of milk suited to the case produces a constant feeling of distension, accompanied by troublesome flatulence. There are also cases in which the patient is very ill and his life in great danger, in which it is impossible to get him to swallow sufficient milk to sustain life. During the past summer I had a case of this kind under my care. A man who had been for two years suffering from chronic diarrhœa acquired in Bombay, complicated with fistula, and an unhealthy condition of the mucous membrane of the rectum, on which Mr. Herbert Allingham found it necessary to operate, fell into a low typhoid condition. The difficulty of getting him to swallow suffi-

cient milk was so great, and his repugnance to it apparently so invincible, that the treatment was abandoned for three days, during which time an endeavor was made to support him on beef-juice. His condition became rapidly worse; there was incessant diarrhœa, the motions being passed involuntarily; the tongue was hard, dry and cracked; the teeth covered with sordes, and the pulse quick and thready. We considered the chances of recovery to be very small; he seemed, indeed, to be rapidly sinking, but I was satisfied that if he were to be saved at all it could only be by milk, and accordingly, exclusive milk treatment was resumed. He could swallow only such small quantities at a time that it was found impossible to get him to take more than two and one-half pints in twenty-four hours. The typhoid condition and incessant diarrhœa continued, without improvement, for forty-eight hours, and it became evident that unless more milk could be assimilated it was hopeless to look for recovery.

I then directed part of the milk to be evaporated to one-half its bulk, and by giving him this evaporated milk he was able to take at once the equivalent of three and one-half pints in twenty-four hours, which proved sufficient to arrest the threatened collapse. Gradually, after a time, his condition began to improve, and he eventually consumed in natural and evaporated milk the equivalent of nine pints daily. He made a perfect recovery, and in five months was shooting grouse in Scotland.

I afterwards prescribed evaporated milk with excellent results in another serious case of wasting from long-standing chronic diarrhœa acquired in India. The patient, who had found it extremely difficult to swallow more than three pints of fluid a day, was able, by taking a certain proportion of his milk evaporated, to consume the equivalent of five pints, gradually lost his diarrhœa, and was able to digest solid food and gained strength proportionately. Other patients

not in the same immediate danger, have been allowed the option of taking part of their milk evaporated, and some of them have thriven on the concession. Others have had no difficulty in taking, and have preferred to take the milk in its natural state.

The two severe cases alluded to above were examples of the chronic intestinal catarrh (not dysentery) which is common in India, and which is often described under the name of "tropical diarrhoea." At the present time I have under my care a typical case of psilosis (*vulgo* "sprue") of long standing, which is steadily progressing toward recovery by the help of evaporated milk. By using part of the milk prepared in this way the patient is now able to take sufficient nourishment to enable the diseased bowel to recover. He has been under medical treatment more or less continuously for a number of years, but I gather from what he tells me that his occasional attempts to get well by milk diet were abandoned, because he could not take sufficient milk to maintain the required minimum of strength. This induced him to supplement his diet by other articles of "invalid" food, and these invariably after a time brought on a relapse.

To evaporate milk properly for patients like these is a matter of some care. A simple apparatus has been made for me, consisting of a small regulating spirit lamp, with a wire stand for holding an enamelled pan containing the milk at a convenient height from the flame. The heat may be increased or diminished at will by the regulator on the lamp. The milk should be heated rapidly, but must not be allowed to reach the boiling point; and in this pan ten ounces can be reduced to five in half an hour. It must be stirred continuously after it gets warm and until it has become cold to prevent a skin forming. If the cream is allowed to come to the top the milk takes longer to evaporate, and the taste is not so good. When the evaporation is properly effected the cream remains mixed in the milk as

usual, but, of course, rises on standing. The milk should, therefore, be stirred before being drunk. Evaporated in this way it has a richer taste and looks richer than ordinary milk, but is not unpalatable. It gets sour more quickly than fresh milk. The process consumes a good deal of time and requires constant attention.

Whilst writing about the treatment by milk I may make a few remarks in connection with one of the diseases for which it is the remedy. There is a note in the *Times* of India, of September 12th, which states "that Surgeon Captain Dyson has traced that the disease known at Darjeeling as hill diarrhoea, and in the Straits and China, by the peculiar name of 'sprue,' is due to the presence in the water of small particles of mica." Psilosis or sprue, has been often written about as identical with hill diarrhoea of India, and I am not sure that, under the influence of Indian medical literature, I have not myself done so at one time.

The affections known by these names have a feature in common, namely, the passing of frequent motions of a light yellow color, which after all is the usual color of motions which are rapidly driven along the small and large intestine. I had, however, at one time a patient suffering from typical psilosis whom I sent to spend a month with her brother, an army surgeon of long experience in India. When he brought her back to me he said: "The disease from which my sister is suffering is new to me. I have not observed it in the parts of India in which I have served, and it is not 'hill diarrhoea,' of which I have seen hundreds of cases." Typical psilosis occurs in Ceylon, and I have seen well-marked examples in patients who have returned from that island. I have not met with evidence to show that it occurs at all commonly in Bombay or Calcutta. Cases of severe wasting diarrhoea from these parts of India about which I have been asked to give an opinion, have so far been none of them cases of psilosis. Typical examples of the two distinct affections—the common

chronic diarrhœa of India and psilosis of the tongue and small intestine—are related in a paper presented by me to the Royal Medical and Chirurgical Society and published in the 75th volume of the Transactions (1892).

As regards the presence of mica in the drinking water as a cause of this disease, I should regard the theory as improbable. I am not familiar with the distribution of mica in the world, but to prove it to be the cause of psilosis it would have to be found not only in Ceylon, but in the drinking water in the Straits Settlements, Hongkong, the whole China coast, and at least several widely distant parts in the interior of China, in Java and in the Philippine Islands, in all of which places psilosis is very common. In the *Encyclopædia Britannica* I find it stated that mica is found in Finland, New York, Canada, Shetland, Sutherland, Rosshire, Inverness, Skye, Fifeshire, and Greenland, from all of which parts no case of psilosis has yet been reported. The only place where psilosis is common and in which the presence of mica is noted is Ceylon. Besides, there are facts connected with the clinical features of this disease which cannot be reconciled with the mica theory. Patients who have been for a long time quite well are subject to relapses from chill and error of diet, although they have returned to England, where no case of this disease has ever been known to arise. Nay, more, the disease may show itself in an unmistakable form for the first time after a patient has returned to England. An extraordinary instance of this occurred in the case of a patient who consulted me last summer. A lady who had returned from China seventeen years before developed unmistakable symptoms of psilosis, which had existed for nearly two years to a slight extent before its nature was detected. The development of all the characteristic symptoms to a degree of considerable severity led to the disease being diagnosed, and under the treatment appropriate to the cure of psilosis

she has made a good recovery. Although she has not enjoyed robust health after her return from China, suffering particularly from anæmia, she had never had symptoms of "sprue" until two years ago.

The proximate cause of psilosis is not known, but the probability that it consists in some organic ferment, very possibly a bacterium, is strong, and I think it likely that the curative action of milk diet is not due to any special therapeutic virtue of milk, but to the fact that it does not contain the pabulum in which this ferment can live. It is impossible otherwise to account for the fact that not only do the soothing foods which are so useful in other forms of diarrhœa not cure this form, but they will often bring on at once a severe relapse. I have often known arrowroot bring back diarrhœa and sore mouth after the patient had not had either symptom for several weeks. The same thing applies, in my experience, to beef-tea and bread, and severe and persistent relapses were produced in two patients by a raw new-laid egg. It seems to me impossible to account for these facts, otherwise than by assuming that in the egg, beef-tea, arrowroot, and, I may add, wheaten bread, a ferment can multiply with a rapidity that cannot be attributed to any inorganic substance.—*Brit. Med. Jour.*

SERUMTHERAPY.

The following is an account of some of the work done in Serumtherapy during the past year:—

Sufficient time has now elapsed and a sufficiently large number of cases of diphtheria have been treated by antitoxin to put us in a better position to judge of the value of the treatment in this disease. Reports from so many different sources speak with so great unanimity with regard to the reduction in the death-rate and mitigation in the symptoms of diphtheria, that there is no room for doubt as to the superiority of this method of treatment

over those formerly in vogue. This reduction in the death-rate is too great and too uniform in the most widely separated countries to be accounted for by a supposed milder type of diphtheria in the last few years, or by the fact that, as Dr. Purjesz points out,* the general interest taken in the antitoxin treatment by the lay papers and the public has led to a large number of mild cases being brought to the hospitals for treatment that would otherwise never have come to them. The statistics may also have been somewhat too favourable for the serum, as compared with the previous treatment, on account of the fact that the now common bacteriological examination often shows the presence of the diphtheria bacillus in cases that would have formerly been regarded as tonsillitis, and that these mild cases are injected with antitoxin. But this would not affect more than a small proportion of the cases. At the same time, antitoxin does not cure all cases of diphtheria, nor would it be reasonable to expect it to do so.

The report of the American Pediatric Society† is based upon the collective returns from 613 physicians, of whom over 600 pronounce themselves strongly in favour of the serum treatment. 3,384 cases are reported: the doubtful cases which died are included in, those which recovered are excluded from, the report. On account of the widely separated localities from which the records came, no local peculiarities can account for the favourable results. No new cases of sudden death immediately after the injection have occurred. In nineteen cases only, injected reasonably early, the serum did not appear to have a favourable influence; of these, in nine the diagnosis was doubtful, three were malignant, four complicated with measles, and

in two the serum was of doubtful value. In three the patients were made worse, but in only one of these could the result be fairly attributed to the injection. The general percentage mortality was 12.3; in cases injected during the first three days, 7.3; excluding cases moribund at the time of injection or dying within twenty-four hours, it was 8.8 and 4.8 in the two groups respectively; in cases injected on or after the fourth day it was 27. Of the laryngeal cases, many severe, one half recovered without operation. In intubated cases the mortality was 25.9 per cent, a reduction of more than 50 per cent. on any other method of treatment. Broncho-pneumonia occurred in 5.9 per cent. In contrast to two or three instances in which the serum is believed to have acted unfavourably on the heart are a large number in which the heart's action was distinctly improved. There is little, if any, evidence to show that nephritis occurred in any case as the result of the injections. Paralytic sequelæ occurred in 9.7 per cent., the effect of the serum being less marked upon the nervous system than on any other part of the body. Injection should be made as early as possible on the clinical diagnosis, not waiting for the bacteriological confirmation; but however late the first observation is made an injection should be given, unless the progress of the case is satisfactory. In severe cases, or in laryngeal diphtheria in children over two years, an initial dose of 1,500 to 2,000 units is sufficient, to be repeated if there is no improvement in from eighteen to twenty-four hours: a third dose at a like interval may be necessary. For severe cases in children under two years and in mild cases an initial dose of 1,000 units is usually enough: it is to be repeated if necessary.

The Metropolitan Asylums Board have issued a statistical report* on the antitoxin treatment in six fever hospitals

* *Wien. med. Presse*, 1896, Nos. 25 and 26; abstract in *Centralbl. f. innere Med.*, 1896, xvii. 1145.

† *Pediatrics*, 1896, ii. 97; abstract in *Am. J. M. Sc.*, 1896, cxii. 214.

* Abstract in *Am. J. M. Sc.*, 1896, cxii. 225.

in 1895, as compared with cases treated in 1894, in which no antitoxin was used, and the mortality was exceptionally low. The general percentage mortality rate is decreased 7.1 in favour of 1895, and in cases in the first five years of life 13.2. The mortality when the treatment was begun on the first and second days of the disease is 4.6 and 14.8 per cent. respectively in 1895, as against 22.5 and 14.8 per cent. in 1894. The mortality in laryngeal cases is reduced from 70.4 per cent. in 1894 to 49.3 per cent. in 1895. The complications of the disease were apparently not influenced by antitoxin. The cases were 2,182 in number, and the authors lay particular stress on the importance of beginning the treatment as early as possible. They point out: (1) A great reduction in mortality in cases coming under treatment on the first or second day of the disease. (2) A general mortality below that of any other year. (3) A particularly remarkable lowering of mortality in laryngeal cases. (4) A uniform improvement in tracheotomy results. (5) A beneficial effect upon the clinical course of the disease.

Further points brought out in other reports are: the great importance of early treatment, some showing recovery of all injected cases on the first day of the disease; the early disappearance of the membrane by the seventh day in over 80 per cent. of cases; the subsidence of severe laryngeal symptoms and the smaller number of cases requiring tracheotomy: the Berlin report states that the mortality decreases as the age of the patient increases: other statistics show a striking decrease in the mortality in cases under five years of age.

Dr. Funck, of Brussels,* on the basis of the collection of a number of statistics, states: (1) Serum treatment diminishes the mortality of diphtheria. (2) Serum treatment often checks the further extension

of the diphtheritic process, and avoids tracheotomy. (3) Sepsis, severe affections of the heart, kidneys, and nervous system are lessened. (4) The serum is absolutely harmless.

In a discussion at the New York Academy of Medicine* Dr. W. H. Thomson gave the following statistics of the antitoxin treatment of diphtheria, drawn from a paper by Professor W. H. Welch in the *Johns Hopkins Hospital Bulletin* for July-August, 1895, and from a summary of the statistics of the treatment, brought up to May, 1896, by Dr. A. R. Guerard. Hospital reports are selected partly because they would not give the most favourable results, and therefore are less affected by the arguments brought forward by the opponents of the treatment. The reports are drawn from 85 hospitals in all the European countries, the United States, Australia and Japan, giving a total of 9,893 cases with 1,820 deaths, or a mortality of 18.3 per cent. "In 53 of these hospital reports there are given statistics of 7,277 cases with a mortality of 20 per cent. under serum treatment in which definite comparisons are made with the mortality previous to the use of antitoxin of 44.3 per cent.; thus justifying the contention that so far as hospital practice goes antitoxin has caused a reduction of fully 50 per cent. in the general death rate." Further statistics from reports of 3,760 cases treated with antitoxin in private practice give 296 deaths, or 7.8 per cent.

A report from the Imperial Health Office in Berlin† for the second quarter, 1895, states that in 2,130 cases treated, excluding cases moribund on admission to hospital, the death-rate was 13.3 per cent. In the first quarter of the year the rate was 16.7 per cent. The injection was practised on the first two days of the illness in 752 patients, of whom only 48 died, a mortality of 6.4 per cent.; a much smaller death-rate

* *J. de Méd., Brux.*, 1896, No. 13; abstract in *Centrabl. f. innere Med.*, 1896, xvii. 1148.

* *Med. Rec.*, 1896, xlix. 893.
† *Lancet*, 1896, i. 331.

than in the first quarter, due to the greater strength of the serum used. Injections performed on the third day gave a percentage mortality of 10; on the fourth day 17.3; on the fifth day, 23.5; from the sixth to the tenth day, 28.3; from the eleventh to the nineteenth day, 17.6. 841 patients suffered from laryngeal diphtheria, of whom 588 were operated on and 176 died; a mortality of 29.9 per cent. Secondary effects noted were, skin eruptions, pains in the joints, and suppuration at the site of injection.

In Glasgow,* in the years 1890-94, the percentage death rate from diphtheria was respectively 39.8, 38.8, 37.2, 40.5, and in 1894, 35.5. In 1895, out of 179 cases 137 were treated with antitoxin, four being moribund on admission and thirty-eight so mild as to give rise to no anxiety. Thus the severe cases only were treated by antitoxin. In seventy-six cases only one injection of from 10 to 20 c. c. was necessary; in the others additional ones were given. Of the total 170 cases twenty-five, or 14 per cent., died. That the fall in fatality is not due to a natural decline in severity of the disease in Glasgow is shown by the fact

that the mortality in home-treated cases in 1895 was higher (24 per cent.) than in 1894 and 1893, 23 per cent. and 22 per cent. respectively. Of tracheotomy cases the fatality rate was in 1893, 76.2 per cent.; in 1894, 86.9 per cent.; and in 1895, only 34.5 per cent.

Dr. Virneisel reports* from the Coblenz Hospital 150 cases treated by antitoxin, of whom 9 died, or 12.7 per cent.; of 22 injected on the first day of the disease, all recovered; the death-rate for those injected up to the third day was 31.6 per cent.; after the third day, 68.4 per cent. Of 79 tracheotomy cases previous to the serum treatment 48 died, or a mortality of 61.4 per cent.; of 64 tracheotomy cases treated with serum 15 died, or a mortality of 23.4 per cent. Of the whole number treated one-third were only brought to the hospital and injected on the fifth day of the disease; and of the 18 deaths 6 patients were brought in a dying condition to the hospital. The author emphasises the great importance of early treatment.

Dr. Karl Fürth gives† the following experience at Freiburg:—

Date.	Cases treated :			
	Without serum treatment.	Percentage of deaths.	Tracheotomy cases.	Percentage of deaths.
June, 1892—June, 1893	95	38.9	41.0	74.3
June, 1893—June, 1894	145	38.6	52.4	67.1
June, 1894—June, 1895	144	19.4	34.7	50
With serum treatment.				
June, 1895—June, 1896	150	15.3	23.3	42.8

Whilst in the earlier periods the death-rate for children under two years was 60—100 per cent. Of 19 cases under two years treated by serum only 3 died, although 8 required tracheotomy. In the later cases a larger dose of serum was employed—1690 units; in several cases 4000 units were administered within twenty-four hours. Of 46 cases treat-

ed on the first or second day of the disease, all recovered.

A later communication‡ from the Caroline Children's Hospital in Vienna states that of 633 cases treated before serum 292 died, or 46.1 per cent.; of 200 treated with serum 34 died, or 17 per cent.

* *München. med. Wchnschr.*, 1896, xliii. 456.
 † *Ibid.*, 669.
 ‡ *Wien. med. Wchnschr.*, 1896, ix. 795.

* *Ibid.*, 1658.

	No. of Cases.	Deaths.	Percentage mortality.	
Cases in which the throat or the larynx was affected and not operated on	<div> <div>before serum treatment</div> <div>with serum</div> </div>	<div> <div>331</div> <div>159</div> </div>	<div> <div>83</div> <div>11</div> </div>	<div> <div>— 25</div> <div>— 6.9</div> </div>
Cases operated on for Croup	<div> <div>before serum</div> <div>with serum</div> </div>	<div> <div>302</div> <div>41</div> </div>	<div> <div>209</div> <div>23</div> </div>	<div> <div>69.2</div> <div>56</div> </div>

1,000 units were injected on admission; if after 24—36 hours no tendency to heal or signs of spreading were observed a second injection was given. In 69 cases localised to the throat there was only 1 death. In 10 out of 28 cases of laryngeal croup symptoms of stenosis declined shortly after admission; 1 died of heart-failure, 2 of pneumonia, six and ten hours after admission respectively; in 15 cases tracheotomy was performed, of which 6 died. Three cases of diphtheria showed signs of septic infection. They terminated fatally, the injection of serum having no influence on them. The membrane disappeared on or before the fourth day in 23 cases, on or before the sixth day in 29, on the seventh day in 8, later than the seventh day in 8. There was albuminuria in 28 cases; symptoms of heart-failure observed in 5. An urticaria-like rash was observed in 9 cases; scariatiniform or erythematous in 7.

The importance of early treatment is also brought out in a series of 352 cases reported by Dr. Aaser.* The mortality in cases treated on the first day of the disease was nil; in those treated on the second day it was .9 per cent; on the third day, 11.6; after the seventh day, 50. The death-rate in cases in which tracheotomy or intubation was necessary was 29.2 per cent. The author thinks that erythema as a consequence of the injection is less frequent if the serum is filtered through a Chamberland filter.

As to the immunising power of the serum, the Coblenz Hospital Report† states that

* *Tidsskr. f. d. norske Lægefor.*, 1896, Jan.; abstract in *Centralbl. f. innere Med.*, 1896, xvii. 923.

† *Loc. cit.*

in four out of 150 cases treated a second attack occurred within twelve months of the first; and at the Caroline Hospital in Vienna relapses were noticed in several cases in a few days—2 to 18—after the first attack treated by antitoxin, and one patient had three distinct attacks in seven weeks. Kassowitz states* that neither a severe attack of diphtheria nor the injection of a large number of “immunising units” of serum brings in man insusceptibility to the diphtheria poison. After larger or smaller immunising doses of serum the attacks of diphtheria are as frequent as without them; the “immunised” person may suffer from an attack of diphtheria as soon as a few weeks or months afterwards, and the attack may be a severe one and end fatally in spite of serum-treatment. Rubens says† that a single injection of 200 units of Behring’s serum should protect against diphtheria for several months. In the case, however, of a child affected with severe diphtheria, a brother aged 5 years, and a sister aged 7, were injected with 200 units as a protective measure. Four weeks later the brother passed through a typical attack of the disease, though not so severe as the first case.

With regard to any ill-effects that may result from the antitoxin injections, it is obviously difficult to say what effects are due to the serum and what to the disease, or in fatal cases to know whether death is actually due to serum. Prof. Kolisko,

* *Wien. med. Wchnschr.*, 1896. Nos. 21—23; abstract in *Centralbl. f. innere Med.*, 1896, xvii. 1145.

† *Deutsche med. Wchnschr.*, 1895, No. 46; abstract in *Centralbl. f. innere Med.*, 1896, xvii. 925.

of Vienna,* who had made 1000 autopsies on fatal cases of diphtheria before the serum treatment was introduced, considers, as a result of his *post-mortem* examinations on fatal cases treated by antitoxin, that the serum favourably influences the diphtheritic process; that as a consequence of it, where a sufficient dose has been given and an interval of not less than twenty-four hours has elapsed before death, the membrane is more easily separated, is looser, or pultaceous, whether in the pharynx larynx, or bronchi, and that the anatomical changes in the organs are the same as those under the ordinary treatment. Perhaps more definite information can be gained from the use of the serum as a preventive measure, and the unfortunate results that have occurred in such cases show that Behring's original statement that the injection of his serum was as harmless as one of normal saline solution was too absolute. There is the much debated case of Prof. Langerhans's little boy, who died suddenly after a dose of antitoxin injected as a precautionary measure, the immediate cause of death not being satisfactorily accounted for. Other cases are given by Dr. Joseph Winters.† A healthy boy of 5 years was injected with a preventive dose of Behring's serum, and death occurred in five minutes (Halderman). A woman injected similarly with 600 units suffered from the most severe collapse for six hours. A boy aged 2 with spastic spinal paralysis, suffered from diarrhoea for four days after a preventive injection of 600 units, and died from collapse on the tenth day (Johannessen). A girl, in good health, aged 3, after an injection of 3 c. c., had a temperature of 104°, followed by albuminuria, hæmaturia, and a petechial rash, and died on the twentieth day (Alfoldi). In a girl aged 6, with slight angina, proved not to be diphtheritic, after a single injection the temperature rose to

105° on the sixth day, a scarlatiniform eruption appeared for the following four days, and death occurred in convulsions (Moizard and Bouchard). In some other cases severe symptoms followed preventive inoculations. Pistor* injected a girl aged 7, who suffered from tonsillitis in which diphtheria bacilli were absent, with 900 units of a serum, with the result that she suffered from a very protracted and variable illness, attended with fever with many remissions and exacerbations, and accompanied by exanthemata, the last of which appeared three months after the injection. These unfortunate results would appear to necessitate caution in the use of antitoxin as a preventive measure.

Drs. A. Seibert and F. Schwyzer,† however, as a result of experiments in the laboratory state: (1) That antitoxin serum does not seem capable of causing threatening symptoms or speedy death, even when brought quickly into the blood-stream in very large doses; (2) The carbolic acid used as a preservative must be in so weak solution as to be unable to cause the characteristic carbolic convulsions; (3) Even very small quantities of air, if injected, will cause severe disturbance and ultimate cessation of breathing, and to this cause the authors attribute the sudden deaths reported.

Dr. Winters‡ spoke unfavourably of the antitoxin treatment. He believes that in certain individuals there is a special susceptibility to antitoxin, grave symptoms or death resulting from a relatively small dose. The predominating symptoms are referable to the nervous centres, kidneys, heart, lungs, and the temperature. One feature of these symptoms, especially the pulmonary, is their late appearance. He brought forward forty-one fatal cases of

* Quoted by Dr. Brannan, *Med. Rec.*, 1896, xlix. 900.

† Discussion at the New York Academy of Medicine. *Ibid.*, 877.

* *Deutsche Ärzte-Ztg.*, 1895, No. 24; abstract in *Centralbl. f. innere Med.*, 1896, xvii. 925.

† *N. York M. J.*, 1896, lxiii. 708; abstract in *Am. J. M. Sc.*, 1896, cxii. 216.

‡ *Loc. cit.*

diphtheria from the Willard Parker Hospital, in which antitoxin treatment was begun early in the disease, and had, in his opinion, an unfavourable influence. It is but right to add that in the same discussion Dr. Brannan, also of the Willard Parker Hospital, combated Dr. Winters's statements, stating that no special form of pneumonia had been observed, nor any *post-mortem* changes in fatal cases that could be attributed to antitoxin.

Dr. J. S. Billings, Jr.,* found in moderate and severe cases of diphtheria the blood corpuscles reduced in number, and only slowly regenerated. Leucocytosis occurs, except in very mild and in very severe cases, the increase in number of leucocytes being generally in proportion to the severity of the case. The percentage of hæmoglobin varies with the number of red corpuscles. In cases treated with antitoxin the decrease in the number of red corpuscles and in the amount of hæmoglobin is less than in cases not so treated. The leucocytosis is not affected. In healthy persons the injection of antitoxin causes in about half the cases a very moderate reduction in the number of red corpuscles and of hæmoglobin, and no change in the leucocytes. No peculiar characteristic changes in the morphology of the corpuscles were made out.

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The diphtheria antitoxin has also been tried in *scarlet fever*, thus: J. Noir† injected 10 c. c. diphtheria serum into a child of 8 years on the third day of an attack of scarlet fever, with severe croupous inflammation of the fauces. The throat quickly improved: desquamation began on the third day after the injection. The chief point of the case lies in the absence of albumen in the urine, and as this occurred in a case of scarlet fever, the author infers that the serum may be used without any fear of irritating the kidneys. Dr.

* *Med. Rec.*, 1896, xlix. 577.

† *Progrès méd.*, 1895, 3e Sér. ii. 145; abstract in *Centralbl. f. innere Med.*, 1896, xvii. 880.

Szegő* treated a case of scarlet fever sore throat of the gravest kind with Behring's serum. Amelioration took place in twenty-four hours, followed by a rapid cure. Bacteriological examination showed the presence of staphylococci and streptococci, but not of Löffler's bacillus. The author invokes Metschnikoff's theory, increased phagocytosis, due to the stimulating effect of the antitoxin, to explain his case.

* * * *

Injections of *anti-streptococcus serum* have been employed in scarlet fever, in erysipelas, puerperal fever, and acute septicæmia. This treatment must be considered as still on its trial, as it has not yet been employed in a sufficient number of cases to pronounce on its positive value. According to T. J. Bokenham,† "Antistreptococcus serum is serum obtained from the blood of an ass which has received during several months repeated and increasing injections of living virulent streptococci. It will be seen at once, therefore, that the principle involved differs in important respects from that involved in the preparation of anti-diphtheria serum. In this last it is the toxins, formed by diphtheria bacilli in bouillon cultures, which are employed to set up immunity in animals furnishing the serum. Antistreptococcus serum . . . may be expected to possess antimycotic rather than antitoxic properties."

Dr. Alexandre Marmorek, seeing the invariable presence in *scarlet fever* of complications due to infection by streptococci, has treated the disease with anti-streptococcus serum. From October 16th to December 31st, 1895, 103 children suffering from scarlet fever entered the Hôpital Trousseau. Seven of these cases were not treated by the serum, because they were in the desquamative stage. Of the remaining ninety-six cases a bacteriological examination showed in all the presence of the streptococcus, either

* *Deutsche med. Wchnschr.*, 1895, No. 51; abstract in *Rev. de Thérap. méd.-chir.*, 1896, lxiii. 10.

† *Brit. M. J.*, 1896, ii. 4.

alone or associated with other microbes. In seventeen other cases Löffler's bacillus was also found. Four of these last cases, which were admitted with symptoms of diphtheria, died in spite of treatment by both the streptococcic and antitoxic serums. All the children received on admission an injection of 10 c. c. of antistreptococcic serum, which was doubled if the general condition was serious. Treatment was confined to serum injections and antiseptic washes for the throat. The injections were repeated daily until the temperature fell. If swollen glands or albuminuria appeared the injections were resumed, and continued until the condition had returned to the normal. In ordinary cases 10 c. c. to 30 c. c. were injected; in more serious ones 40, 60, 70 c. c., and in one child of 4, with scarlatinal rheumatism, who recovered completely, 90 c. c.* The most striking effect was on the swollen glands; in nineteen cases with this complication, resolution occurred in all without suppuration. In four children who were admitted with suppurative otitis, the serum promptly stopped the purulent discharge. The advantages claimed for this treatment are—the prevention of grave complications, the rapid disappearance of false membranes, relief of delirium, improvement of the general condition, and a fall of temperature if fever be caused by complications due to streptococci. The fever caused by the scarlet fever virus pursues its ordinary course, as does the eruption, supporting the view that the disease is not caused by the streptococcus.† A later report says that Marmorek has treated 411 patients with a mortality of 3.4 per cent.

Baginsky‡ said he had used the serum of Marmorek in fifty-seven cases, from which nine must be deducted as the treatment was not fully carried out. In twenty-seven cases

a fall of fever followed the injection, though, as this is sometimes observed in cases not so treated, it cannot be directly attributed to the serum. The sore throat and enlarged glands yielded in from three to five days, inunctions of iodine ointment being also used for the latter. In sixteen cases the serum treatment was entirely inefficacious. Some cases died from intensity of scarlet fever poison, in spite of the injection of maximum doses of the serum. In other less serious cases, suppuration of the cervical glands occurred. There remain five cases in which single injections were employed merely to combat complications, and with good results. The total mortality during the serum treatment was 14 per cent., instead of 22–24 per cent. in the previous period, too small a difference on which to base a favourable conclusion.

Dr. Dubois of Lille* also finds that injection of the serum causes an abrupt fall of the temperature if the fever be due to the streptococcus and not to scarlet fever poison. A dose of 10 c. c. is sufficient. The throat cleans rapidly, glandular swelling and otitis are relieved, and he considers that albuminuria may be prevented by use of the serum from the first.

M. Josias† has used two kinds of antistreptococcic serum; one prepared from the sheep, the other from the horse. In the first series 49 children were injected with an average dose of about a drachm without accident, save some urticarial eruptions. In the second series 96 children received from two to eighteen drachms, resulting in various complications, among which were streptococcic abscesses, lymphangitis, and polymorphous eruptions. With sheep-serum the mortality was 2.08 per cent.; with horse-serum, 5.31 per cent.; with ordinary treatment as before serum it was 5.81 per cent. There were no serious results.

* *Bull. méd. du Nord*, April 10, 1896; abstract in *Rev. de Thérap. méd-chir.*, 1896, lxiii. 368.

† *Presse méd.*, 1896, No. 42; abstract in *Am. J. M. Sc.*, 1896, cxii. 470.

* These quantities represent the total amount injected during the illness.

† *Ann. de l'Inst. Pasteur*, 1896, x. 47.

‡ *Med. Week*, 1896, iv. 143.

He considers that the serum apparently acts upon streptococci, which do not cause suppuration.

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On the other hand, Dr. Variot* found in ten cases of children affected with *membranous tonsillitis*, in whom he injected 10—20 c. c. of the serum, the results so grave that he has abandoned its use. The temperature was raised two or three degrees for some hours, the children became prostrate with dry tongue, and an abscess formed in the abdominal wall even when the injections were made with due antiseptic precautions.

M. Comby also states† that the mortality of this disease treated by Marmorek's serum was 8 per cent., whilst in the same pavilion the previous mortality was 5 per cent. Not only did the anti-streptococcic serum fail to lower the mortality, but it did not prevent the complications due to the streptococcus.

Prof. Petruschky‡ states that his repeated experiments of Marmorek's anti-streptococcic treatment do not confirm the statements given by the latter, and that there is yet no certain proof of the possibility of a serum-treatment against streptococcus infection. No protective influence could be obtained against "Marmorek's streptococcus" nor against two equally virulent organisms cultivated by Petruschky, either with Marmorek's serum or with that prepared by Niemann of Lyons after the method of Marmorek. He also, as the result of experiments on animals, advises against the practical application of the serum.

* *J. de Clin. et de Thérap. inf.*, 1896, No. 23; abstract in *Rev. de Thérap. méd.-chir.*, 1896, lxiii. 368.

† *J. des Praticiens*, 1896, No. 20; abstract in *Am. J. M. Sc.*, 1896, cxii. 216.

‡ *Centralbl. f. Bacteriol. u. Parasitenk.*, 1896, Bd. 20, No. 4/5, and *Ztschr. f. Hyg. u. Infectious-krankh.*, 1896, Bd. 22, No. 3; abstract in *Wien. klin. Wchnschr.*, 1896, ix. 877.

M. Deléarde,* of the Institut Pasteur de Lille, on the use of Marmorek's anti-streptococcic serum in *erysipelas*, says, first, that it is non-toxic, and has been used in newborn infants without any harm; it may be used in large doses. In *erysipelas*, as soon as the diagnosis is made, 10 c. c. of the serum are to be injected into the subcutaneous cellular tissue of the flank: benign cases are generally cured by one dose; if not, a second dose is injected after an interval of twenty-four hours. The temperature and the pulse are the guides to the need for repeating the dose. The effects of the serum show themselves from the fifth to the twelfth hour in a fall of temperature and pulse-rate, relief of headache, disappearance of albumen from the urine, and in improvement of the local signs. Occasionally, twelve hours after injection, a little pain, redness, and sometimes œdema, appear at the site of puncture, but as a rule these pass away without any trouble. Two or three hours after the injection there is a rise of temperature, which rapidly falls again. Desquamation begins early and is in large shreds. As said above, when the case is mild and injections are begun early, a single one is sufficient; if it is further advanced the fever yields more slowly, and cases of ambulant *erysipelas* usually need repeated injections.

At the Vienna Medical Society, Prof Chrobak† described three cases in which anti-streptococcic serum was employed. The first case was one of *erysipelas* in a lying-in woman, who recovered in three days. In the second case symptoms of sepsis came on in a woman after operation for myoma; 30 c. c. of serum were injected within two days, after which her condition improved. In the third case, one of puerperal fever, 25 c. c. were injected in three days: the fever and rigors continued until

* *Nord. méd.*, 1896, iii. 17; abstract in *Rev. de Thérap. méd.-chir.*, 1896, lxiii. 332.

† *Lancet*, 1896, i. 75.

after the last injection ; but on the next day the fever rapidly decreased. Prof. Chrobak has not formed a definite opinion as to the value of the injections, but believes them to be harmless.

M. Bolognesi* criticises the results obtained by Chantemesse in the serum-treatment of erysipelas. He points out that many cases are remarkably mild, and that the mortality varies with the time of the year and the form of the affection present. He gives an account of 1,000 cases at the Hôpital d'Aubervilliers, in which the total mortality was 3.5 per cent. In cases under different forms of treatment, but with no very bad ones, the mortality was .9 to 1.2 per cent. These last may be compared with those of M. Chantemesse, in which the mortality was 1.7 per cent. in those treated by *sérum efficace*, and was 1.03 per cent. in those treated by *sérum très efficace*. The general result of the serum-treatment of erysipelas gives a mortality of 2.59 per cent., and may be compared with the general mortality of the disease varying from 2—4 per cent. He considers that the serum-treatment, to be properly tested, must be tried on acute, severe cases, the mild ones being rejected.

* * * * *

Anti-streptococcic serum has been used in *puerperal fever*.† Dr. Ledrain‡ has recently reported a case in which the condition on the ninth day after delivery was as follows : Temperature 104°, pulse 148, small, compressible, tympanites and tenderness of abdomen, fœtid diarrhœa, dryness of tongue, and quiet delirium. 5 c. c. of anti-streptococcic serum, obtained from the Institut Pasteur, were injected. Next day the temperature had fallen to 101.3°, the pulse to 120. Six injections of 5 c. c. each time were made daily for five days, then an interval of a day was left and the last injection given. On the day following the third

injection the temperature was 104°, the pulse 130, and there was some redness and swelling at the site of the first injection; the next day this had disappeared, and the patient made an uninterrupted and complete recovery.

Dr. McKerron* reports three cases of puerperal fever thus treated. The worst case died, the others recovered. In the former four injections of 10 c. c. were given; in the two latter, three and two injections respectively : the injections were made into the arm, and in one of the successful cases tenderness at the site of injection and an erythematous rash over the limb were noted; no other symptoms due to the injections were observed. The author thinks that the good effects of the serum were shown in improvement of the pulse and subjective condition of the patients.

* * * * *

Messrs. Ballance and Abbott report† a case of *acute hemorrhagic septicæmia* treated by anti-streptococcus serum. The patient, a medical man, pricked his thumb whilst making a *post-mortem* examination on a case of suppurative peritonitis. Pain and swelling of the thumb began the same evening. The day after the temperature was 103° F.; there was a scarlet septic erythema over the whole body, the pulse was rapid and soft, and there was drowsiness, with shooting pains in the arm. Next day the condition was worse, the temperature being 104.7°, the pulse 150, with rapid respiration and increased drowsiness. 3.5 c. c. of anti-streptococcus serum (Burroughs, Wellcome & Co.) were injected every four hours; after eight injections, 7 c. c. were used; twenty-eight injections were made in all. The patient gradually recovered, the temperature reaching the normal on the twelfth and thirteenth days. The effect of the serum was shown in that (1) the mind became clear in spite of high fever; (2)

* *Progrès méd.*, 1896, 3e Sér. iii. 106.

† See *Bristol M.-Chir. J.*, 1895, xiii. 139.

‡ *Progrès méd.*, 1896, 3e Sér. iii. 227.

* *Brit. M. J.*, 1896, ii. 1033.

† *Ibid.*, 2.

frontal headache ceased; (3) the tongue began to clean; (4) the pulse became slower and stronger and the respiration slower; (5) the skin became moist; (6) the wounds healed without suppuration.

Two cases of blood-poisoning, in which the symptoms were severe, were treated by injections of anti-streptococcic serum by Messrs. A. H. and A. R. Cook* with good results; in the second case the effect of the serum is doubtful, as the injections were not made until three weeks after the local infection.

Another case of recovery from acute septicæmia after injections of anti-streptococcic serum is reported.† Mr. L. Strangways Hounsell relates‡ the case of a boy in whom a tooth was removed for alveolar abscess, and who was taken shortly afterwards with severe symptoms of septicæmia. His temperature was 104.5°, the pulse 156; at first delirious, he shortly afterwards became unconscious, with loss of control over micturition and defæcation. He was treated with injections of anti-streptococcic serum, with remarkable results; very soon after the injections the boy got better, and ultimately completely recovered.

* * * *

Dr. W. H. Weaver§ has used anti-streptococcus serum in the treatment of three advanced cases of *pulmonary phthisis*, with the result of reducing the pyrexia and the amount of expectoration.—J. MICHELL CLARKE in *Bristol Med. and Surg. Jour.*

THE USE OF COLD IN FEVERS.

H. A. Hare in a clinical lecture strongly advocates the application of cold in the reduction of fever. The author agrees that none of the organs of the body are strained in the effort at eliminating foreign materials, nor are their functions perverted by the presence in them of powerful remedies.

On the contrary, the proper application of cold, associated with active rubbing of the skin to bring the blood to the surface, improves the circulation all over the body, increases nervous and circulatory activity, produces an elasticity of the blood-vessels which is destroyed by the use of drugs, and increases the action of the kidneys,—the organs which eliminate from the body most of the impurities. Although it would seem inconsistent to state that fever is a protective process and that the use of cold for its reduction should be advocated, in reality it is not so. There is a great difference between stopping oxidation processes by the use of drugs and abstracting heat from the body by the use of cold. When cold is used heat-production probably goes on with even greater rapidity, at least, after a brief time. By the bathing the bodily temperature is prevented from rising to the point at which the fever would be dangerous in itself, while at the same time the poisons produced by the disease are more rapidly burned up by the increased rapidity of oxidation. In other words, the application of cold simply increases the draught and so burns up the refuse more rapidly than before.

These conclusions are not merely theoretical ones. Careful experiments by Liebermeister and other investigators in this line prove that in many instances leucocytosis is markedly increased by the use of cold, and it is a well-known fact that by its use internal and external congestions are avoided, which, if they came on in full force, would seriously imperil the patient's life.

The manner in which the cold should be used in the reduction of fever is of the utmost importance. Some observers claim that fever, particularly typhoid fever, must always be reduced by actually placing the patient in the bath-tub, the water of which is at a temperature varying from 70° to 80°, or even lower; but it has always seemed to me that equally good and, in all probability, better results could be obtained if the use

* *Brit. M. J.*, 1896, ii. 1315.

† *Ibid.*, 647.

‡ *Clin. J.*, 1896, ix. 46.

§ *J. Am. M. Ass.*, 1896, xxvii. 542.

of cold were fitted to the case, just as the dose of digitalis or any other drug is fitted to the case. No one would think at the present day of asserting that every case of heart disease requiring digitalis as a cardiac tonic should receive exactly twenty drops of the tincture three times a day, but the common assertion would be that the dose of digitalis should vary with the necessities of the case. If, therefore, by means of careful sponging, or the use of water with friction, at temperature of 85° or 90° , you can reduce a patient's temperature within a short time to 100° or 101° , surely this method is sufficient for the case. On the other hand, if colder water is required, it must be used, and the time of its application prolonged in direct proportion to the degree with which the fever resists treatment. And, finally, if repeated sponging with ice-water or with water at 60° or 70° fails to reduce the temperature, then it will be necessary to place the patient in a bath and perhaps to keep him there, rubbing him all the time until his fever is properly reduced. There is no such thing in medicine in connection with the use of drugs as recommending one definite dose for every case of any disease, and there is no such thing as a correct recommendation of one temperature or one method of the application of cold to every case of a given disease. To be successful practitioners you must make your "punishment fit the crime," or, in other words, you must make your remedy and your dose fit your case just as the tailor makes a garment fit each man.

As regards the comparative value of antipyretic drugs and cold sponging or bathing in the treatment of non-infectious fevers, such as are represented by sun-stroke, clinical experience has proved that under these circumstances the antipyretic drugs possess little value, and that we must always rely chiefly upon cold bathing for the relief of patients suffering from thermic fever.—*Therapeutic Gazette*, October 15, 1896.

FORMALIN—A NEW DISINFECTANT.

The following from the July number of *Modern Medicine and Bacteriological Review* introduces our readers to a new, and, if reports are correct, highly valuable germicide:—

Numerous carefully conducted experiments have demonstrated the great value of the formalin as a disinfectant. Formalin has a very peculiar odor, but this quickly disappears from articles disinfected. It may be used in gaseous form, or in solution. A solution of formalin effectually prevents the growth of the most dangerous pathogenic microbes, such as the bacilli of anthrax, of typhoid fever, diphtheria, cholera, and such pus-forming germs as the staphylococcus pyogenes aureus.

In a 1 per cent. solution, formalin will kill nearly all pathogenic microbes in thirty minutes. A 3 per cent. solution kills all pathogenic microbes except those of anthrax in one minute. The bacillus of anthrax requires three minutes. A 3 per cent. solution of formalin containing a small per cent. of alcohol renders the hands completely sterile. Clothing, furniture, etc., may be completely disinfected in ten minutes, without injury, by spraying with a 10 per cent. solution of formalin. Fecal matters may be almost immediately deodorized by a 1 per cent. solution. A weak solution of formalin is an excellent preservative of tissues. It is useful therapeutically as an application to the bowels, by which a sloughing is produced, causing a speedy separation of the dead from the living tissues.

A NOTABLE STATEMENT—VACCINATION.

At the Jenner centenary held at Berlin a little while ago, Virchow said that we live in an era of reverence for the great benefactors of mankind. Of the number of these, as regarded the number of human beings saved, Jenner stood at the head. As an ethnologist he was impelled to mention an ethnological fact in the history of pro-

fective vaccination: "All peoples that had not been reached by vaccination, or that had not accepted it, had disappeared from the face of the earth, destroyed by small-pox."—*Sanitary Inspector*, July, 1896.

FLIES AS CARRIERS OF GERMS.

As far back as 1886, Hoffman demonstrated the presence of tubercle bacilli in the bodies of flies captured in a room occupied by a consumptive. The droppings of the flies were full of the bacilli, which were shown by experiment to be fully virulent.

Six years later, Dr. A. Coppen-Jones, of Switzerland, by employing cultures of chromogenic bacteria, proved that infection can be, and actually is, carried, not only in the bodies of flies, but also by their feet. In one experiment pieces of a culture of the bacilli prodigious were mixed in a mortar with some highly tuberculous sputum in such a way that stained preparations showed these two varieties of microbes to be present in about equal numbers. Flies were allowed to light on the sputum, and, after they had flown about for a time, were permitted to walk across the surface of sterilized potatoes. In forty-eight hours numerous colonies of the bacillus prodigious made their appearance.

From this result we can reasonably conclude that flies are a constant source of infection. More especially is this the case in those warm countries where germ growth and decomposition are favored, and where no means whatever are employed to exclude flies from living rooms.—*Exchange*.

VALUE OF SUNSHINE.

While we may well prize that shade which offers protection against the oppressive heats of summer, we must keep in mind the great value of an abundance of sunlight in and directly around our dwelling houses. Sunshine is not only a tonic and a purifier, but is a disinfectant—an efficient germicide. It not only builds up animal and vegetable cells, but, when it comes in contact with

them, it tears down and destroys those unicellular organisms of darkness, the disease-producing bacteria.—*Sanitary Inspector*, July, 1896.

ONIONS AS A NERVINE.

Onions are almost the best nervine known. No medicine is so useful in cases of nervous prostration, and there is nothing else that will so quickly relieve and tone up a worn-out system. Onions are useful in all cases of coughs, colds and influenza; in consumption, insomnia, hydrophobia, scurvy, gravel, kidney and liver complaints. Eaten every other day they soon have a clearing and whitening effect upon the complexion.—*N. Y. Medical Times*.

INFLUENCE OF TEA AND COFFEE UPON DIGESTION.

Schultz reports, in a recent number of the *Zeitschrift Physiol. Chem.*, 1895, a series of experiments made for the purpose of determining the influence of tea and coffee upon digestion. The results are as follows:—

1. Under the conditions of the experiment, there was ninety-four per cent. of albuminous digestion when neither tea nor coffee was added to the digesting mixture.
2. On the addition of tea, the amount of digestion was only sixty-six per cent.—nearly one-third less.
3. When coffee was added, the amount digested was still less, being only about sixty-one per cent. That the simple dilution of the fluids was not the cause was shown by the fact that when distilled water was added, there was practically no change in the amount of digestive work done.

A NEW OPERATION FOR THE RADICAL CURE OF INGUINAL HERNIA.

George Sully Vaughan (*Journal of the American Medical Association*, July 25, 1896) describes his operation for hernia. The cord is placed deep next the perito-

neum, and passes through the abdominal wall (down over the symphysis pubis) both obliquely and where it is strongest, more than half of the circumference of the anterior opening being formed by bone and tendon. Another advantage is that the two ends of the inguinal canal are placed nearer on the same level, thus obviating the bad effects of gravity. The technique is as follows:—

(1) Make an incision over the inguinal canal from internal abdominal ring to the centre of the symphysis pubis through the skin and fascia; then split the fibres of the aponeurosis of the external oblique, exposing the cord and hernia sac.

(2) Separate the sac from the cord, ligate or sew across well within the internal ring, and cut off the redundant part.

(3) Divide the conjoined tendon through its muscular part four or five centimetres above its insertion, including the internal pillar of the ring, down to the peritoneum, avoiding the deep epigastric artery. Separate by blunt dissection the conjoined tendon from the rectus and pyramidal muscles down to the pubic bone, and place the cord in this position between the conjoined tendon and the rectus. The cord still passes through an oblique canal at its anterior portion, as the conjoined tendon overlaps the rectus and pyramidalis for two and a half centimetres or more, being inserted in front of these muscles. Unite the divided ends of the conjoined tendon and of the internal pillar with mattress sutures, and accurately approximate them with continuous or interrupted sutures.

(4) Close the old inguinal canal with interrupted sutures, uniting Poupart's ligament to the conjoined tendon, and in the outer part including the transversalis fascia over the cord. Two or three of these sutures are passed through the conjoined tendon to include the edge of the rectus.

(5) Unite the superficial structures with a continuous suture and the skin with a subcuticular suture.

Kangaroo tendon is advised to be used throughout the operation.—*University Medical Magazine*, Nov., 1896.

MORPHINE AN ANTIDOTE TO POTASSIUM CYANIDE.

Six grains of morphine were injected under the skin of the back of a dog, when after a short period of excitation he slept. At the end of an hour, the animal being still alive, in order to hasten death, a subcutaneous injection of ten cubic centimeters of a 3.3-per-cent. solution of potassium cyanide was administered, which produced a most surprising effect; the creature awoke and became very lively, this condition persisting for some time, when he was seized with convulsions. He died an hour and a half after the injection of the cyanide. The evidence goes to show that cyanide of potassium neutralizes the effects of morphine, and that morphine retards the toxic action of cyanide.

Subsequently a series of experiments were made on mice. After establishing the minimum fatal dose of morphine, and also of cyanide, animals were subjected to injections of the latter, and subsequently to injections of morphine, when it was found that those that had received fatal doses of opium alkaloid could be saved by means of potassium cyanide, and *vice versa*. Thus the two drugs appear to be mutually antidotal.

The theory enunciated regarding the mechanism of neutralization is, that through the influence of the iron in the blood, the latter being an alkaline medium, there are formed Prussian blue and oxide of morphine.—*Münchener Medicinische Wochenschrift*.

AN EASY AND READY METHOD OF CIRCUMCISION.

John W. Ross, surgeon of the United States Navy (retired), says in the *Medical Record*, Aug. 31, 1895: "Retract the foreskin; insert the glans penis up to the corona into the open mouth of a glass test-tube,

draw the foreskin well forward over the end of the tube, tie a strong, small silk cord very tightly around the foreskin, immediately in front of the flange of the tube; amputate the foreskin one-eighth of an inch in front of the constricting cord by a circular sweep of the knife; unite the mucous and cutaneous edges of the stump of the prepuce by eight or ten fine interrupted sutures; cut the constricting cord, remove the tube, cover the cut edges well with powdered iodoform; encircle the anterior half of the penis with a roller bandage of iodoform gauze, allowing the meatus to project slightly for facility of urination without soiling or removing the dressing, and keep the patient in bed, with penis elevated, from twenty-four to forty-eight hours."

RABIES IN CATS.

It is not well known that cats, as well as dogs, are subject to rabies. At the Pasteur Institute, in Paris, one in twenty of all the cases treated are due to the bites of rabid cats.

THE THERAPEUTIC VALUE OF HYDROBROMATE OF SCOPOLAMINE IN PLASTIC IRITIS.

In the *American Journal of the Medical Sciences* for November, 1896, Oliver concludes an article on this subject as follows:—

Hydrobromate of scopolamine is of the greatest value in the local treatment of the various forms of plastic iritis. Its primary reparative action and quieting power, as compared with those of similar doses of sulphate of atropine, in the treatment of plastic iritis, are generally much more prompt, even when the latter drug is used in doses equal to quadruple or quintuple the strength of the former. Its healing and soothing effects do not seem to be so lasting, even when the drug is used in four or five times the strength of the atropine.

For quick and active measures, which are so eminently necessary in incipient cases of plastic iritis, and during the early stages of inflammatory reaction, the scopolamine salt is to be preferred to the atropine;

but where prolonged use of such drugs is necessary, as in many cases of the chronic form of the disease with subacute exacerbations, the alternate employment of scopolamine and atropine seems empirically to be the best method of local administration that has been devised.

As clinically employed, the best salt of the alkaloid seems to be the hydrobromate; the best method of instillation, dropping the solution upon the upper corneal border while the lower punctum is everted and the corresponding canaliculus is pressed upon; and the most efficient amount to be used at one sitting, two drops of a one-tenth of one per cent. strength (1:500), repeated, if necessary, as often as three times during the course of an hour, and preceded, when desired, as in some instances where there are much irritation and pain, by two drops of a two-per-cent. solution of hydrobromate of cocaine a few minutes before each instillation of the scopolamine.

OIL-OF-CADE COLLODION.

Gaucher presents a new collodion composed of acetone collodion, $\frac{2}{3}$; oil of cade, $\frac{1}{3}$ —*La France Médicale*, November 20, 1890.

MORPHINE-ETHER NARCOSIS.

Riedel (*Berl. klin. Woch.*, September 28, 1896), alluding to the fact there are more sequelæ (such as bronchitis, etc.) after ether than after chloroform narcosis, states that in the former cardiac paralysis and sudden arrest of the respiration do not occur. To guard against the danger of bronchitis, the sensibility of the bronchial mucous membrane should be diminished in order to lessen secretion. For this purpose the author gives an injection of morphine before the administration of ether. He has come to use this method more and more widely. Before the fourteenth year, however, the morphine is omitted. From 13 to 18 years of age 0.005 gramme ($\frac{1}{2}$ grain)

is given, and to older persons 0.01 gramme ($\frac{1}{8}$ grain). This amount may not be sufficient in drunkards. Half an hour after the injection the ether is administered cautiously, only 3 or 4 grammes (45 to 60 grains) being poured on the inner side of Julliard's mask. The mask is not pressed on the face at once; so that time is allowed for the patient to get used to the ether, and thus there is no tendency to cough. The mask has a cover of oiled paper, and a few drops of ether are from time to time poured through the opening in it. If the operation only takes an hour the effects of the morphine will last, and very little ether is necessary, but in longer operations much more ether may be required. Sleep is prolonged after the operation for a considerable time. The author has never observed bronchitis in children after ether. He has employed this method of anæsthesia for operation on all parts of the body during the past three years. If it were not for bronchitis ether would be an ideal anæsthetic. Even fifty years after the discovery of chloroform a safer anæsthetic than chloroform is wanted. At present he observes that we must be satisfied with ether, which he looks upon as the best available anæsthetic. In only one case was death directly attributable to the ether, and the patient was here the subject of emphysema. There have been isolated cases of pneumonia, mostly in elderly and cachectic persons, and not to be put down to the ether. Ether exercises an irritant action upon the bronchi, and Riedel believes that the greater part of its dangerous properties may be avoided by the above-described mode of administration.—*British Medical Journal*, November 14, 1896.

CURE OF INGUINAL AND CRURAL HERNIA
BY TENDINOUS AUTOPLASTY.

Poulet performed a genuine deep-seated tendinous autoplasty, using a portion of one of the tendons of the thigh. This

tendon is separated below from its muscular insertions and remains adherent to its upper, osseous insertion. A long portion of the crural triceps is used in inguinal hernia, and the first adductor or long portion in crural hernia. The peritoneum is not opened. Two incisions are made: one parallel to the arcade, to reach the sac; the other vertical, upon the course of the right anterior muscle of the thigh, to dissect a tendinous strip. This is passed below the sartorius muscle near the first incision. A large needle is used to draw it through the walls of the canal, and the extremity of the tendinous band is fixed to the thickness of the pyramidal and rectus muscles by two metallic points, including the skin. Suture of the two cutaneous wounds is then practiced.—*Marseille-Médical*, November 15, 1896.

BENZONAPHTHOL AND SALICYLATE OF BISMUTH IN SUMMER DIARRHŒA.

Solomon Solis-Cohen states that he has never met with a better mixture for disinfesting the digestive tube than one composed of equal parts of *benzonaphthol* and *salicylate of bismuth*, with or without the addition of *Dover's powder*. A child six months old may take three grains (0.20 gramme) of the two former ingredients,—i.e., $1\frac{1}{2}$ grains (0.10 gramme) of each. It is important to suspend the milk diet during the active treatment. *Barley-water* in small quantities may be substituted. The use of the various flours, which readily ferment in summer, and which contain toxins, should also be discontinued. Another error which must be avoided is the administration of astringents: kino or tannic acid. The physicians prescribing the latter remedies assist the disease rather than the patient. (*Revue de Thérapeutique*, November 1, 1896.)

CARBOLIC ACID IN INFLUENZA OF CHILDREN.

S. H. Dessau, of New York, recommends the internal administration of *carbolic acid*

in cases of a mild irregular type of influenza. Finding that cases of this kind did not recover so rapidly as he expected under the ordinary sudorific and expectorant treatment, he tried carbolic acid, and after an experience of 300 cases he pronounces it very efficacious. In the cases referred to there was a dry cough, worse at night, with signs of slight bronchial catarrh, alternating sometimes after chills with coryza and diarrhoea. The annoying cough was often relieved in two or three days, always within a week. The dose given was a teaspoonful of a 1-per-cent. solution for a child of 5 years, and it was administered every two hours until decided improvement was noticed, and afterward at longer intervals. Only in one case did nephritis occur, and Dessau was inclined to attribute it to the influenza, and not to the carbolic acid. (*Medical Record*, September 12, 1896.)

SULPHONAL IN THE TREATMENT OF THE
NIGHT-SWEATS OF PHTHISIS.

F. Combemale, of Lille, has found, after a series of clinical observations, made with the assistance of Descheemaeker, that sulphonal administered in doses of from 15 to 30 grains (1 to 2 grammes) is efficacious in combating the night-sweats of tuberculous patients, while exercising at the same time its usual hypnotic effect. This antihydrotic action, however, is only produced in the cases in which the preliminary lesions are not very far advanced, and fails in subjects having large cavities in the lungs. The medicine should be given just before retiring. If it is administered with the evening meal, as is frequently done when sulphonal is given as an hypnotic, the night-sweats are in no way benefited. This is probably due to the fact that the anti-sudorific action of the sulphonal is rapidly exhausted. The author found that patients become accustomed to sulphonal when it has been administered more than fifteen days. (*Journal d'Accouchements*, Nov. 1, 1896.)

BACILLUS OF MEASLES.

J. Czajkowski (*Centralblatt für Bakteriologie Parasitenkunde*, 1896, XVIII, Nos. 17 and 18) states that he believes he has found the bacillus which produces measles. He examined the blood of fifty-six patients having this disease, thirty-seven specimens being examined microscopically, and cultures made in nineteen cases.

The bacilli, like those described by Pielicke and Cannon, were thin rods varying in length from 0.5 up to the diameter of a red-blood corpuscle; they are extracellular.

They are stained irregularly by all aniline dyes.

Cultures grow on various media, but not upon gelatin or agar. Blood added to the media increases their development. In solid media the cultures first show on the third or fourth day in the form of dewdrop colonies. A media composed of sterilized serum from the abdominal cavity seems best suited to their culture, and in this the colonies form a heavy sediment, varying from a white to a yellowish-gray color. They thrive best at blood temperature.

Rabbits are immune; mice die of septicemia from a subcutaneous injection in three or four days. The bacilli were recovered from the blood, liver, and spleen in pure cultures.

A METHOD WHEREBY RUSTING OF INSTRUMENTS DURING STERILIZATION IS
PREVENTED.

Levai (*Wiener Klin. Rundschau*, 1896, No. 31), after an experimental investigation as to the rusting of instruments, finds that the process is due to carbonic acid contained in water, and that it is not absolutely prevented by the addition of carbonate of soda, as recommended by Schimmelbusch. He states that rusting can be greatly lessened by first boiling the water before placing instruments in it, since thus the greater part of the carbonic acid is expelled. The most efficient means

he finds is to add to the boiled water 0.25 per cent. of sodium hydrate, pure, containing no sulphur. During the operation the instrument should lie in the solution thus prepared. Sharp knives placed in this solution do not lose their edge in the faintest degree.

TREATMENT WITH SERUM FROM CONVALESCENTS.

Weisbecker has observed (*Therap. Wochenschrift*, June 28) that if serum taken from patients recovering from measles be injected into others during the stage of incubation, the incipient disease is much modified, and cases of measles and pneumonia sometimes arrested. He urges others to make experiments of this nature in scarlet fever, measles, etc.

EPITHELIAL SOWING.

F. von Mangoldt, of Dresden (*La Semaine Médicale*), has reported a new method of skin-grafting to which he has given the name of "epithelial sowing."

The epithelium is obtained by scraping a healthy cutaneous surface. For this purpose the external or internal surface of the arm is considered preferable. The chosen spot is carefully shaved and disinfected, and then with a sharp, sterilized razor, held perpendicularly to the skin, the epidermis is scraped away until the papillary layer is reached. In this way a magma is obtained, composed of epithelial cells and extravasated blood, which is spread upon the surface to be treated, and thoroughly pressed in with a spatula. In case of a fresh wound, the sowing is very simple; but in case of an infected wound, it is necessary to remove the granulations and thoroughly disinfect.

In order to make sure that the epithelial elements adhere closely to the wound, it is advised to scarify it with a small and very sharp bistoury before spreading the scrapings upon it. The spot from which the epithelium has been taken is dusted with dermatol, covered with sterilized

gauze, and bandaged. The grafted area is covered with strips of protective plaster, over which an aseptic dressing is placed.

The transplanted area during the days immediately following the operation looks as if covered with a pseudo-membrane; it loses its primitive brick-red color, and becomes yellowish-gray, a change due to coagulation of fibrin. At the fifth or seventh day the fibrin begins to disappear, and the color changes to blush-rose, the first sign of the proliferation of the epidermic elements. Towards the middle or end of the third week the surface is completely covered with epithelium. After the fifth day the dressing is changed every two days, and the wound gently irrigated with a warm, sterile, normal salt solution. After the tenth day the surface is dusted with boric acid.

PERSIAN CURE FOR DYSENTERY.

Surgeon-Major T. S. Avetoon, of the British army in India, communicates to the London *Lancet* a prescription from a medical work in the Persian language, which he says he has used successfully, with a slight modification, in about thirty cases of dysentery, during a little over two years. The dose is a dram of cinnamon bark reduced to a fine powder and made into a ball with a few drops of water, and is repeated morning and evening until a cure is effected. He says that his patients have often been cured with one or two doses, and his worst cases with five. The powerful antiseptic and germ-killing property of cinnamon will be recalled in this connection.

RECENT AIDS IN THE DIAGNOSIS OF TYPHOID FEVER.

By CHARLES LYMAN GREEN, M.D., in the *Medical Record*, November, 1896.

He first refers to the difficulties which heretofore have existed in many cases of typhoid in making an early diagnosis; then mentions the principal clinical signs of the

disease, none of which are pathognomic, but are only important in their grouping.

He then gives his modification of Ehrlich's diazo reaction, which he has found to yield more accurate results.

The formulæ are as follows:—

Solution A.—Hydrochloric acid, 50; distilled water, 1,000; sulfanilic acid, q.s. ad sat. This solution should be most thoroughly saturated, allowed to stand some days before being used, and shaken up from time to time.

Solution B.—Five-tenths solution of sodium nitrite in distilled water. Should be kept in a cool place, and black bottle, and renewed every week or ten days.

Solution C.—(test solution).—One part of solution; B; one hundred parts of solution A. This solution should be freshly made for each day's testing.

Method of applying Test.

Equal parts of the solution C and the suspected urine are thoroughly shaken up together in test tube, and from one to two cubic centimetres of ammonium hydrate allowed to flow gently down upon the surface. If the reaction be present, a beautiful crimson or carmine band appears at the junction of the ammonia with the mixture. Upon shaking, a pink tinge is imparted to the foam.

This test appears very simple, and no one would suppose that any serious blunders would arise in the hands of competent men. We find, nevertheless, one of the greatest living authorities upon clinical diagnosis reporting it as valueless, and omitting all mention of ammonia in his description of the test. The same error occurred in the work of a very celebrated clinician, who found it in normal urines. Another elaborate report winds up with a reference to the yellow color of the ring. Another used a five-per-cent solution of sodium nitrite, and could not get rid of the reaction. He found it in everything. Still another used sodium nitrate. His results

were naturally deplorable, and he cruelly condemned the test. Such, sometimes, is the boasted accuracy of scientific medicine.

As I test this typhoid urine, you will notice that the color is not yellow, nor orange, but red. It must be red, or there is no reaction. Now, here is the urine of pneumonia and advanced tuberculosis. The color is orange. In the first specimen, shaking produces a pink foam; in the second no pink is to be seen. The following rules are all important:—

1. The urine must be fresh and filtered.
2. The urine must be acid.
3. The true color is red, and when the urine is shaken the foam should be slightly tinged with pink.
4. The test solution C is to be freshly prepared each time and accurately measured. A medicine dropper and a marked test tube will insure this.
5. The sodium-nitrite solution must be accurately made, and renewed at intervals of a week or ten days, and be not stronger than 0.5 per cent.
6. The color band should be held against a white back-ground, the light falling upon it from behind the observer. It must not be held against the light.
7. The exact method of procedure must be conscientiously carried out.
8. The test is to be made during the height of infection.

The urines of 315 cases comprising over fifty diseases were tested. In 64 cases of typhoid it was present in 61, in no one of the 3 cases of supposed typhoid was the case typical. It was present in 2 out of 16 cases of pulmonary tuberculosis, in both cases sepsis was prominent, 3 of 4 cases of septicæmia showed it, 2 in 4 of carcinoma, and 1 in 11 of pneumonia, a severe and double case; in no other instances in the fifty diseases was it present.

He then demonstrated the method proposed by Widal to diagnose typhoid, by adding to a pure culture of Eberth's bacillus a drop of blood from a supposed typhoid. The

method is simple, and has so far proven to be reliable.

—
THE DIAGNOSTIC VALUE OF THE SERUM
OF TYPHOID-FEVER PATIENTS.

Mr. Herbert E. Durham, F.R.C.S., contributes an article on this subject to the *Lancet* for December 19th in which he states that both Dr. Widai and Dr. Grünbaum have recently and independently directed attention to the possible use of the serum of patients suffering from typhoid fever in a new method of diagnosis of the fever by means of the clumping or agglutinative effect upon living typhoid bacilli. These researches, he says, naturally followed upon the investigations published by Professor Gruber and himself. Their observations have been made with the view of seeing whether the serum of individuals, healthy or suffering from other diseases, was endowed with an agglutinative power upon the typhoid bacillus. His own observations, which were begun independently early last summer, were undertaken on other lines—namely, to see whether a positive reaction could be obtained in all cases of undoubted typhoid fever. It is clear that if positive evidence is not obtainable in all instances the diagnosis cannot be absolutely fixed in cases of doubt. Dr. Grünbaum, says Mr. Durham, has shown that in conditions other than typhoid fever the blood serum has no positive effect upon the typhoid bacillus when it is sufficiently diluted; Dr. Widai's observations agree in so far as he has apparently used dilutions only of about one in ten. The author states that this is in accordance with his own extended observations upon animals immunized against various kinds of microbes, in which it appears that in high dilutions (from one to five per cent.) positive reaction is only obtained with the same microbes or kinds very closely allied to those used in immunizing the animal from which the serum was obtained. His observations upon typhoid fever in man show that positive results are not invariably ob-

tainable, consequently some cases will remain doubtful even with this addition to the means of diagnosis. All the author's cases were clinically typical cases of typhoid fever, and, he says, they therefore stand or fall together. The acuteness or mildness of the attack and the occurrence of relapses do not appear to be factors which necessarily conduce to the amount or presence of typhoid "agglutinins" in the serum. Further, a doubtful case was examined (if typhoid fever, the case was tested in the third week during pyrexia—temperature 104° F.), but no definite reaction was obtained.

The reaction is not always obtainable either during the original attack or during relapses, or after them. However, the study of the serums of immunized animals (rabbits, etc.) shows that they have little or no clumping action shortly after the first immunizing inoculation, and the typhoid fever patient or convalescent is really *only immunized to a very slight degree*—a degree, however, which is generally sufficient to protect him from further attacks.

A note upon the method may be added, continues the author, since Dr. Widai suggests such heroic measures as removing the blood by means of a hypodermic syringe thrust into a vein of the arm. Ample blood may be obtained from the lobule of the ear without giving pain to the patient; moreover, without contamination with microbes. The lobule of the ear is well cleaned with lysol solution (two per cent.), dried, and a small incision made with an ordinary clean bleeding lancet; a fine sterile pipette is applied to the exuding drop of blood. When sufficient blood is obtained (from 0.2 to 0.3 of a cubic centimetre is enough, but more is easily withdrawn if necessary) it is blown out into a sterile test tube which is held horizontally so that the blood does not flow to the bottom. The test tube is laid down flat until the blood is thoroughly and firmly clotted; it is then placed upright and the clear serum trickles down to the bottom of the tube; this requires several hours. Clear

serum can be obtained more rapidly by allowing the tube to lie horizontally for about half an hour, and then placing it in a centrifuge, which is driven quite slowly for five or ten minutes; if the rotations are too rapid a certain number of red corpuscles are carried out with the serum, but even then clear serum is obtainable as the corpuscles are driven to the bottom. A dilution containing from five to six per cent. of serum is best adapted for testing; this is most conveniently done by taking up from twenty-five to thirty cubic centimetres by means of a graduated capillary pipette and adding 0.5 of a cubic centimetre of the broth emulsion of bacilli in a small test tube. Measuring may also be done by means of drops, though of course less accurately. The specimens should be examined microscopically in hanging drops after from ten to thirty minutes for the detection of clumps. In general the naked-eye reaction is not so well marked as in the case of highly immunized animals. A sample of the emulsion should always be kept as a control, without the addition of serum. Only young (from twenty-four to thirty hours) and vigorous cultures, preferably on agar, should be used; old and weak cultures often give some clump formation without the addition of serum. Lastly, the emulsion should not contain too many bacilli; a small loopful (from two to three milligrammes) is quite sufficient for each cubic centimetre.

Mr. Durham thinks that in recent cases of typhoid fever an absolute diagnosis cannot always be obtained by means of the serum test, but this means of diagnosis should not therefore be discarded, or should it be allowed to fall into discredit by overrating its real value.

PROF. VAUGHAN—TYPHOID FEVER AND CONSUMPTION.

Prof. Victor C. Vaughan, Dean of the Medical Department of the Michigan University, July 28th delivered to the summer school students at Ann Arbor a lecture

upon the prevention of disease. Speaking principally of typhoid fever and consumption he said that 3,000 persons die annually of consumption in the State of Michigan, and that 50,000 die of typhoid fever in the United States every year! He deprecated the fact since "both diseases were easily prevented."

As a preventive measure he said that in Hamburg and Berlin the sputa of consumptives was required to be disinfected by law. As a result of these precautions the mortality from those diseases has decreased greatly. He thinks the medical profession is at least one hundred years in advance of politicians and of those in charge of municipal affairs; that in time cities or districts charged with the duty of protecting the health of the people will be held responsible by the courts for outbreaks of typhoid fever. The *Bulletin* has been trying to enforce this truth for some time. He gave two simple and easily practiced rules for the prevention of both these diseases. They are well worthy of a faithful and universal trial. He says, "to prevent typhoid fever boil your water;" "to prevent consumption use a cheap paper cuspidor and burn it twice a day."

Both these measures are inexpensive and within the reach of all. Paper cuspidors can be obtained of the druggists at a very trifling expense and should be used by all persons having consumption, pneumonia or diphtheria, and should be promptly burned—using one not longer than half a day—including the night.

This advice coming from one so eminent as a physician, and from one with such extensive observation and such careful and varied experimentation should be heeded by all and be cheerfully and sedulously practiced.—*Iowa Board of Health Bulletin*.

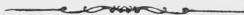
INTERNAL BATHS IN TYPHOID FEVER.

H. Duchenne recommends the following procedure: (1) allowing the patient to drink all he wants (upon this point every-

one appears to agree) of inert liquids, such as *ptisans*, slightly-acidulated drinks, *water* slightly colored with *red wine*, and weak *grog*; (2) giving a daily tepid enema (from $\frac{1}{2}$ to 1 quart—litre). For the suggestive effect 10 grains (0.65 gramme) of *sulphate of quinine* in two doses are given, and a small quantity of weak carbolized *water* (2.50 per cent.) is placed in the injection.

The results are as follow: Rapid diminution of the diarrhœa; lowering of the fever,

which rarely exceeds 39° C. (102.3° F.) after the fourth and fifth day of treatment; convalescence at the end of twenty-one days, on an average. *Diet: milk*; no bouillon, which is a poison, unless very fresh, when the kidneys are affected; no feculent substances, or soups made without meat. From 2 to 4 quarts of *milk*; 2 or 3 weak *grog*s; no astringents, not excepting wine (*Bull. Gén. de Thérapeutique*, October 23, 1896.)



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Editorial.

Dr. Hodge has said so many nice things about us in his valedictory, that we fear that those unacquainted with us will be expecting from us a higher degree of excellence in the editor's chair than we may be able to attain. We appreciate the compliment paid us by the Association in our election to this post. We feel our inability to worthily succeed such men as Mathews and Hodge. The Journal has steadily increased in interest and usefulness from the first, and it has never been better than at the end of 1896. How shall we be able to maintain this increasing excellence? We can only re-echo our predecessor's words and bespeak for ourselves the cordial support of the members of the Association, "without which the best editor in the world cannot conduct a magazine." We have wondered somewhat why we were chosen to this post, and can find no reason, except possibly, that it was because we had written so little for the Journal in the past. Rather than take one of the faithful contributors, the Association has prompted one of the faithless to a recognition of his duty, and has put upon him the work that he in the past has failed to do. Brethren, I repent in sack-cloth and ashes. Learn of me to write regularly for the Journal. If you don't we will have a number of department editorships created and will put the greatest sinners among you into them.

We are glad for the valuable suggestions made by Dr. Hodge. We hope that they may be put into practice and thus make the way of the editor easier and the Journal more generally useful to all classes of medical missionaries. First among them is the one in regard to having department editors to take charge of the compiling of "Medical and Surgical Progress" in the domains of medicine, surgery, dermatology, and the like, and also one who will have charge of the pages devoted to the Evangelistic side of our medical work. Our idea in this would be not so much scissors and paste work as a general review of progress in each department in the form of a report or digest. This could be long or short as the department editor might desire, or the circumstances

would warrant. The report would need to cover all of the important items of progress, and in a manner sufficiently minute as to detail as to be most useful to the reader. For the present year we would be glad to have volunteers for this work. We hope to bring the matter up in some manner so as to have regular editors for these departments chosen at next election.

We feel that the Notes and Queries can be made most practical if members of the Association will take an interest in the matter. It will take but a few minutes to jot down notes in regard to anything unusual one may have noticed in diagnosis, the result of treatment, local peculiarities, Chinese medicines, or any other subject that would be of general interest. These can be made to cover a wide range of subjects.

The time has come when the advisability of issuing the Journal monthly should be seriously considered. We are now putting out a Journal of over one hundred pages. Could we not increase its general usefulness by issuing it monthly and reduce its size to forty or forty-eight pages? Would not the general interest in the Journal on the part of the medical profession of the east be increased? And while retaining its character as a medical *missionary* journal, could we not make it of use to all medical men practicing in China, Japan, and Corea? We think so, and would suggest this for the consideration of the members of the Association.

Finally, we desire to urge the members to send in items in regard to their evangelistic work. The *Double Cross* and other home missionary papers receive articles and letters from our field that would be most interesting reading to our brethren. The primary purpose of our work is preaching the Gospel of the Lord Jesus Christ. Believing as we do, that in this Gospel not only do we find the only hope of salvation for the soul, but also the solution of the world's unrest, social misery, and political wrong, we are always glad to know of each other's success in bringing the people to its acceptance. Tell us of your progress and allow us to rejoice with you. Send us a copy of what you send to the home papers, and if we have not space to print it entire, we will abstract it for the benefit of our readers.

We commend the President's Address to the careful perusal of our readers. The suggestions made therein are of great interest to every member of the Association, and indeed, to every medical missionary in the east. We desire to emphasize the recommendations there made.

Under the pressure of our own individual work we are apt to forget that we have a helpful influence to exert toward the spread of rational ideas of medical practice throughout this rapidly opening field. We stand as the representatives of rational methods for the relief of human suffering; as the harbingers of a Gospel of cleanliness and hygiene; as the apostles of scientific living; as the pioneers in the teaching of scientific medicine to this great nation. Therefore it behooves us to take a broad view of our opportunities and responsibilities and act in such a manner as will do credit to the noble profession we represent, and fairly exemplify our Christian civilization.

The day is not far distant when thoroughly educated Chinese physicians will be taking a high place in the profession, as Kitasato, Aoyama, and other Japanese have already done. Then our hospitals and dispensaries will be largely manned by native physicians. What sort of physicians will they be? In regard to those who are to be the shining lights of the profession we need not trouble ourselves. They can receive our help and co-öperation, but with or without these they will care for themselves. The sort of training the rank and file of the profession shall receive is, however, a question of the greatest moment to us at the present time. This is the day of beginnings, and beginnings are always important events. Shall we commence with a standard of training that will produce men that will be a credit to the profession? or shall we rest satisfied with a smattering of knowledge that will only fit our students to become second-rate hospital assistants, or medicine peddlers for the manufacturing pharmacists? We say, by all means the former. Are there no text-books? Prepare them. Is there no vocabulary? Make one. Is there no periodical literature? Prepare it. Is there no demand for this sort of literature? Neither is there for Bible. We must create the demand by demonstrating the utility and necessity of such literature. But all of these things will necessitate harmony of action and mutual co-öperation on our part. And we must be willing to sacrifice a little of our time and thought to the general good. Indeed we must go farther than this, and be willing to make mutual concession of opinion.

It is to be hoped that we as an Association will come up to our responsibility on all of these questions. Else we will awaken some of these days to a realization of the fact that our "occupation is gone." China is indeed moving,—floundering, may possibly just now be a better term,—like a man just awakened out of sleep, the power of co-ördination is weak, but when new life begins to thrill through her veins,

she will take her place on the great arena of the world's activities and demonstrate what indomitable patience can do for a people when it is coupled with a progressive spirit.

Since the last issue of the JOURNAL three prominent members of the Association have gone home on furlough, viz :—Dr. Boone to America, and Drs. Douthwaite and Hodge to England. The return of Dr. Boone was necessitated by the severe illness referred to in the December number of the JOURNAL. We trust that the change home will fully recover his health and strength, and that he will be able to return to his work in due time. Dr. Douthwaite goes to take his children to the home land and to rest himself for a while, and Dr. Hodge goes on a well earned furlough. Drs. Parry and Judd take Dr. Douthwaite's work at Chefoo, while Dr. Morley relieves Dr. Hodge at Hankow.

Errata.—In Dr. A. P. Peck's letter in the September, 1896 number, Dr. Whitney's initials should read "W. C.," not "U. C." Also, toward the close of the letter, for "*curvations*," read "*curvatures*."

We are much saddened to hear of the death from diphtheria of two children of Dr. and Mrs. Watson of Ching-cheu-fu. We have not heard the particulars, but understand that they were attacked with a severe form of the disease and quickly succumbed. Their third child was also attacked, but recovered. Our heartfelt sympathy goes out to our brother and sister in their bereavement. Only those who have looked for the last time on the faces of their little ones as they have been laid away know how much has gone out of the life of the sorrowing parents. Still their memory remains to us as a bitter-sweet boon; and when we think that they wait for us in God's Kingdom in all their child-like innocence and purity, we even rejoice that though separated from us it has been granted to them to enter into the larger life. May the God of all comfort console and keep the bereaved ones.

We offer no apology for reprinting Dr. Thayer's article on *Blood Examination*. There is probably no better or more concise an article written upon this subject. The clinical and diagnostic value of blood

examination is of rapidly growing importance. The day is fast approaching when the examination of the blood will be as much a matter of routine in fevers as the use of the clinical thermometer and noting the pulse has been in the past. As a basis for a practical knowledge of this work this article is invaluable.

A proposition to extend the privileges of the Association to medical missionaries resident in Japan, Korea, and the Straits Settlements is in order. We are sure that our co-workers in those countries would be glad to join in with us; and such an arrangement would serve to keep up the *esprit de corps* between all of the medical missionaries of Eastern Asia. If some one will formulate and move the proposition, we will be pleased to second it.

ANATOMICAL TERMS.

The question of medical nomenclature will be greatly advanced if two short sets of terms, which may be regarded as the basal terms of medical science, are once fixed upon. These are the names of the elements and the names of the bones. Other terms are of course very important, but in any case these must first be cleared out of the way, as they must constantly be used in forming others. Osteologic terminology, as worked out by Osgood and others, has been much improved upon by Whitney in the last edition of the vocabulary accompanying the 全體闡微, but there still remains much to be desired in this direction. In our opinion the following changes are advisable.

It would be well to adopt the new nomenclature for the vertebræ, viz., the cervic, or 項脊骨, the thoracic, or 胸脊骨, the lumbar, or 腰脊骨, the sacral, or 骶脊骨, and the coccygeal, or 腔脊骨. 項 being a more specific term is a better one than 頸. The latter refers to the neck as seen from the front, and is of wider application than 項, being used for the constricted part of any object. It is of frequent use in anatomy in such terms as the neck of a bone, the neck of the bladder, the neck of the uterus, etc.

背 should be discarded for the same reason that we are discarding "dorsal" in English text-books. 胸脊骨 would indicate the vertebræ which, together with the ribs and sternum, go to make up the bony thorax, or 胸膺. 鈎, "an iron hook," is a miserable term for the sacrum, and inasmuch as there is a name in Chinese for this bone there

is no reason why we should not use it. 骶 is the proper book term. The coccyx is also called the 骶腔, or 腔 alone, and this is the term that should be used, unless we are searching for Darwin's missing link, in which event we should continue the term at present in use. The term for the occipital is properly written 頤, not 枕. The best term for the temporal is 顳, or 顳顳, and this latter is the one in use by the Japanese. 耳骨 properly refers to the ossicles of the middle ear. The division of this bone into squamous, petrous and *mastoid* portions, as given in the old books, should be discarded, and the morphologic divisions of squamous, 鱗段, petrous, 石段, and *tympanic*, 鼓段, substituted. The mastoid, instead of the external ear as given by most of the old books, is really the base of the petrous pyramid. For this reason it might be called the 石底, or, if regarded simply as a process of the temporal it could be called the 顳凸. 馬乳 shows the ridiculous side of attempting to translate into colloquial Chinese a scientific term derived from a dead language. "Mastoid" sounds all right in English, and we will guarantee that not one person in a hundred thinks of its derivation when using it. But "horse teat" is quite another affair, and no doubt the Chinese greatly wonder why we should use such a term and apply it to a little prominence on the side of the skull. The best term for the mandible is 頤, and this will fit in well with terms for the surrounding organs and tissues. For the clavicle the proper and only term is 隅, and so it should be designated, (see Kang Hsi). For the carpal bones 腕 is sufficient without the 手. The tarsals should be called 跗. This is also true of the metacarpals; 掌 alone being used for these, and 蹠 for the metatarsals, as 指 and 趾 are used for the manal and pedal phalanges respectively. 骰骨, or 骰似骨, is the best term for the cuboid, while the tarsal cuneiform should be called 楔骨, or 楔似骨, and designated as 內, 中, 外. 腿骨 is no more suitable for the femur than is 臂骨 for the humerus. There are a number of terms that might be used, among which 髀 seems to be the best approved by Kang Hsi. But the trouble with this term is that it covers too much; really the whole of the region from the lumbar vertebrae to the knee. 髌 is a much more specific term, and is probably the best of all. The innominate bone is rightly called by Whitney the 髌. If he had dropped the 髌 for the ilium, and used 髌, and if he had added the "bone" radical to his term for the ischium, (髌), he would have had an ideal set of terms for this bone. To reduce the number of terms as much as possible, and to bring all into conformity with a plan, the acetabulum should be called 髌盂, instead of 盆臼. For the fibula we have the choice of two excellent terms. 腓 is the calf,

and 訂 is the bone of the 膕. Or, 腓腸 is the calf, and the bone could be called the 腓骨. The gastrocnemius muscle should be called the 膕肌, or 腓腸肌, and the soleus the 副膕肌, or 副腓腸肌. We prefer the 膕 in both cases. The Chinese have a distinct term for the patella, namely 膕. It is explained in Kang Hsi as 膝蓋骨, and gives us one character instead of two for use in compound terms.

A few other important terms require notice, and first of all that for gland. 核, at present in use, means a nut or kernel, and in common phraseology is used for enlarged cervical glands, (生核). With this meaning it was originally written 柎. But this expresses a pathologic condition rather than a normal one, and this term is used for too many purposes, being made to stand for these, for glands in general, for the cell nucleus, and for the cerebral nuclei. For these last two purposes it is a good term, and should be restricted to this use. It certainly does not well express the idea of a gland, especially when we come to include the monotubular glands of the stomach and intestines. Nor can it readily be applied to such large organs as the mammary gland or pancreas. The Japanese term is a most excellent one. Whether they coined it, or where they got it, we do not know. It is 腺. Made up of "flesh" and "fountain" it gives the idea of a fountain in the body, which, whether we speak of secretory or excretory glands, expresses the true function of these organs, and we favor its adoption in place of 核.

While speaking of glands the pancreas naturally comes in for consideration. "Sweet-bread," of which the present Chinese term is a translation; pancreas, "all flesh;" these surely are unfortunate names for an organ of so much importance. The Germans *only* have a term that adequately expresses the function of this organ, viz., "Bauchspeicheldrüse," or abdominal salivary gland. If we translate this term we will have 腹涎腺. Or, if we consider that the chief digestive ferments are manufactured in this gland, and if we call a ferment 酵, we may call this organ the 酵腺. We prefer, however, the German term; calling the parotid 腮涎腺, the submaxillary 頰涎腺, and the sublingual 舌涎腺.

Another term that certainly needs changing is that for albumin. 蛋白 is only one form of albumin, and although we may speak of serum-albumin as 血汁蛋白, it is a cumbrous expedient, and when we come to distinguish egg-albumin as 蛋蛋白, or 蛋白蛋白, or 蛋清蛋白, or 蛋黃蛋白, the terms become ridiculous. 精 is a good

term, but has a specific use of the greatest importance in Histology, Embryology, and Physiology as the true and only term for semen. Hence it *cannot* be used for albumin. But there is a character with the same sound, similarly constructed, not in common use, the meaning of which as given in Kang Hsi is "the essence of lean meat,"—and this is its *only* meaning,—which in our opinion would answer admirably. It is 精. With this single character for albumin, terms for the compound albumins can easily be constructed.

For cell 珠 is not a good term. It is better used as a distinctive character for the blood corpuscles. 輪 is used for condyle, and the white corpuscle is not a 輪, but a 球. Therefore 珠 is much the best term for corpuscle. It is also used for any small prominence on the surface of a bone. For cell we prefer the Japanese term, 細胞. This term will apply where 珠 does not.

筋 is required to do too much work. It is used for tendon, for cord, for ligament, for fascia and for nerve. It is not a good term for this last named purpose. As its composition shows, it refers rather to the binding together with sinews or ligaments, and has only been applied by the Chinese to nerves from a misapprehension of their function. If we regard the nervous impulse as something akin to electricity we certainly will not desire to use so dead a term as 筋, but will want something with the idea of "conveying." A careful study of the character 經 will impress anyone with its admirable fitness for this purpose. The idea of "running lengthwise," of "passing through," and of its being applied to the vessels of communication in the body, prove it an excellent term for nerve. It is so used by the Japanese. Some may object to it on account of its being so commonly used for other purposes. Certainly, this objection cannot stand as against 筋. Such a term as 線 is inadmissible. But if 經 cannot be adopted, then 系 is the next best, and a perfectly unobjectionable term.

Some slight changes in the present terms for artery and vein are desirable. The Chinese do not distinguish between these, calling both 脉. To use 脉 肱 for artery and 迴 肱 for vein, does not distinguish the latter as a blood vessel and uses 肱, a term that should be restricted to glandular and other ducts. It seems desirable to use 脉 for both artery and vein and then to prefix some adjective to distinguish between them. The Japanese use 動 脉 and 靜 脉, and these are very good terms. 迴 脉 may be used for vein if it is thought desirable, but as 迴 is also used for "recurrent" it might be better to leave it for this purpose alone.

Evangelistic.

We extract the following from correspondence to the *Independent* in regard to a conference lately held in Toronto: "Dr. Virgil C. Hart, Superintendent of Canadian Missions in West China, who is about to depart for his distant mission field, gave a farewell address. To few men does it fall to twice re-establish a Chinese mission. Yet this was the experience of Dr. Hart; first, as Superintendent of a Methodist Episcopal Mission in China, and last year as Superintendent of the Canadian Mission at Chentu, in the province of Sze-chuen. All the missions at Chentu were destroyed during the Chinese war, but have been re-established with ampler hospital and preaching accommodation, and with brighter auspices than ever. Dr. Hart purposes founding a printing press for the diffusion of Christian literature, the only one in a population of fifty millions of people."

Also, the following in regard to famine relief in India will be appreciated by some of our brethren in the north: "Such a howling, unreasoning and disorderly crowd as one gets into, when he tries by himself to distribute a little relief, he prays never to see again. Then when the famine is over and their wants are supplied, some of the survivors prefer the roving habits they have formed to a regular life in home or school. You may clothe and feed them, and they will walk off with the clothes you give them and choose to get their food by stealing in the bazaar to having it regularly in school or elsewhere."

In a letter in regard to the outlook in Japan the correspondent says: "The Buddhists do not seem so bitter in their opposition as in the past. They are beginning to find out that opposition does not weaken or destroy Christianity. Only about a month ago (just before my return), quite a large meeting was held in Tokio, composed of Buddhists and a few of the Christian teachers and preachers. The evangelical ("orthodox") ministers, as a rule, did not approve of such a gathering. They thought no good would come of it. During the meeting one of the Buddhist speakers (a priest, I think), uttered words something as follows: "Christianity is a fixture in Japan; it has come to stay. It is to be one of the religious and moral forces in the land. Therefore, my advice is that we cease to antagonize each other. Let us, as far as possible, live in harmony and work together for the best interests of the people." The shades of Buddha! What a change of front.

This is one of the old schemes of the Buddhists. What they cannot overcome or control they will make friends with, hoping thus to hold the ground already gained, or, finally, to absorb so much of Christianity into their own system as to make it a useless and powerless organization. The latter is the way they finally gained a permanent footing in Japan in the

olden time. She took on so much of the ancient faiths of Japan as to make them harmless competitors, if not practically useless. The absorbent power and eclecticism of Buddhism in the past has been very great. It is to be seen what success she will have, if she really attempts to court Christianity and absorb some of its elements. It is proposed to hold such meetings twice a year. I think the proposition comes from the Buddhists."

The following shows some of the vexations occasioned by the opposition of a "Christian" governor of the island races in Micronesia: "This governor last year ordered the "Star" to stay away from Ponape, and the missionaries "to mind their own business." At this time it was reported from the Spanish ship that "the governor had a sore head," which may, in part, account for the message. After this, however, he visited at the mission stations on Kusaie, and was much pleased with our work. This may be the cause of his change of attitude toward the "Morning Star." He sent word to the other islands that the "Star" was to come to Ponape, and when the invitation was accepted, he was most cordial in his welcome. He allowed the natives to go on board freely, and those on the ship could visit any part of the island, save two localities, Jokoite, near the colony, and in the Metalinim tribe. This is good, so far as it goes; but this governor returns to Spain very soon, and his successor may also have a "sore head." It seems to be chronic in these Spanish governors.

In the Gilbert Group the work has been greatly hindered by a wave of heathenism which swept through the group. The over-sympathetic British Commissioner was sorry for the natives in that they had so little pleasure, and granted permission to dance twice a year. In justice to him it is but fair to say he had some of the natives give him a "specimen dance." It is needless to say they left out the objectionable features; he could see no harm in that, so granted the permission, which started the ball rolling. It swept from island to island, carrying sin and famine in its train. In the midst of it this commissioner left. Another man has taken his place, and is devoting his energies to undoing the work of his predecessor. He is reported as "finding flogging a good antidote for dancing." We are hoping his influence may be felt throughout the group."

THE SALVATION ARMY.

By WILLIAM JAMES BAKER.

Who are these in quaint array,
 Marching down the staring street,
 Through the dust, 'mid trade's harsh bray,
 While the mocking rabble bawls?
 Voice of voices thus they greet:
 esus calls!

Throbbing drum and piercing brass
Rhythmic mark their plaintive psalm;
Flags, queer mottoes, on they pass,
Bravely beck'ning sin's weak thralls;
Magdalene may find her balm:
Jesus calls!

Is this worship, this grotesque
Praying while the cymbals crash?
See, the preacher, quite burlesque,
Pious orgies oft instals;
Can it be beneath such clash
Jesus calls?

Doth our God command we shall
Seek Him, learned, gloved and nice,
Chant a polished ritual?
With all baits the Devil trawls;
Deem'st thou but by smooth device
Jesus calls?

Lo! He weary walks this earth,
Doubting where to lay his head;
Is he sought by men of birth?
Nay! to him the leper crawls;
That the poor have Gospel bread,
Jesus calls!

Where the Church of Christ erewhile
Drew her garments daintily,
In the slums, in garrets vile,
And where open vice appals,
These the Master served—their plea,
Jesus calls!

Tho Religion Folly's cap
Here be wearing, cease debate!
For this Army fronts Hell's gap.
Echo of the ages falls
On their hearts compassionate:
Jesus calls!

Grant delusion here may be,
And thou, scorner, hast the light:
Christ, who hung on Calvary—
Still they force high heaven's fair wall
Who, while marching through earth's night,
Heed Thy call.

—*The Independent.*

OPIUM SMOKING IN INDIA.

Mr. W. S. Caine, who is at present on a visit to the temperance societies throughout India and Burmah, writes from Gwalior, under date December 14th, to the *Alliance News*:—"I was glad to find that in the slums of Bombay and other large cities in India, where four or five years ago a hundred debased wretches could be counted in single opium dens, helplessly drunk on poisonous drugs prepared for them by a Christian government, this horrid vice has now completely disappeared. For the first time, in the annual statement of the moral progress and condition of India, the government is able to state that during last year 'no shops were licensed for the sale of chandu and madak, or of opium prepared for smoking.' Licenses are now only issued for ordinary opium."—*The Christian*.

DAILY CARES.

Bring your cares to God by prayer in the morning; spread them before Him, and make it appear by the composure and cheerfulness of your spirits that you have left them with Him. Daily prayers are the best remedy for daily cares.—*Matthew Henry*.

CHRIST'S YOKE.

Christ's yoke is easy, and His commandments are not grievous—not because He lowers the standard of duty, but because He alters the motives which enjoin it, and gives the power to do them. Christ's yoke is padded with love, and His burden is light, because, as St. Bernard says, it carries the man who carries it.—*Dr. Maclaren*.

"YOUR NEW RELIGION."

Dr. Mary J. Hill writes as to the Medical Mission in Chi-ning-chow, China:—"We have had a large attendance at the hospital. Our rooms for the women are very small and too few to accommodate all the patients wishing to remain with us. It is very hard for us to say we cannot keep them when they come so far and are so anxious to remain for treatment. I feel that these women are sent to us not merely for the benefit we give them physically, and I long to have them remain and hear about the Great Physician, who has led them to us. There is a wide field in Chi-ning-chow for work among the women, and I hope we shall prove true to the charge given us, and do the work only as God would have us. We had some very

serious cases last season, that cost us many anxious thoughts and fervent prayers that we might be guided aright in our treatment, and that the friends of the patients might be led to look more favourably on us and the , doctrine.' A woman from whose face we removed a large growth said one morning, 'Are you glad this lump has gone?' and when we said 'Yes,' she replied, 'Well, I do not understand how it is you are glad, and yet you are strangers. How is it you are so interested in me? It must be your 'new religion.'"—*The Christian*.

WHY ARE THERE FEW CONVERSIONS?

Many are trying to account for the few conversions and the little interest shown in religion. The cause is put down to many reasons, such as worldliness in Christians, want of obedience, of faith, of prayer, of humility; but we seldom hear the most likely reason—want of LOVE. This may be more plainly seen if we consider the following texts:—

John xiii. 34, 35.—A new commandment give I unto you that ye love one another; as I have loved you, that ye also love one another. By this shall all men know that ye are My disciples, if ye have love one to another.

1 Peter i. 22 (last clause). . . See that ye love one another with pure heart fervently.

John xv. 12, 17.—This is my commandment, that ye love one another as I have loved you. These things I command you, that ye love one another.

1 Peter iv. 8 (first clause) R. V.—*Above all things* have fervent love among yourselves.

Rom. xiii. 8–10.—Owe no man anything, but to love one another: for he that loveth another hath fulfilled the law. Thou shalt love thy neighbour as thyself. Love worketh no ill to his neighbour: therefore love is the fulfilling of the law.—*The Christian*.

MEDICAL MISSIONS.

I take the following notes from the November Quarterly Paper of the Edinburgh Medical Missionary Society. When the victorious French troops entered Antananarivo it was thought that the disturbed state of Madagascar would soon be settled. But the whole country, with the exception of the capital and a few garrisoned towns, was in a state of ferment and lawlessness. Two of Madagascar's most devoted missionaries, with their little girl, have been cruelly murdered, and others have had to fly from their stations to save precious life. The flourishing Norwegian Mission Station at Antsirabe, with its medical mission hospital

and leper village, have been utterly destroyed. Hundreds of churches have been burnt or razed to the ground, and teachers, evangelists and pastors hounded from place to place. The medical missionary hospital at Antananarivo is one of the best equipped mission hospitals in the world, though not by any means the largest. It was built chiefly by the Friends' Foreign Mission Association, and is maintained by that mission and the London Missionary Society. On September 30th, 1895, the Capital was attacked, and for some time the hospital was in considerable danger. One shell burst just in front of the hospital, but no one was injured. When the surrender of the town took place the hospital staff were very busy in attending to the wounded, and there the French and Malagasy were first gathered and reconciled under one roof. The French doctors praised the well-trained native nurses highly. Soon after General Duchesne's return to Paris, the French government granted Miss Byam, the lady superintendent, a medal of honour in acknowledgment of her devotion and help.—*Bristol Med. and Surg. Journal.*

Satan would have us try to-day to bear to-morrow's burden with only to-day's grace, and would dismay us with anticipations of troubles which loom in the distance, leading us to disobey the directions, "Take no thought for the morrow," "Be careful for nothing;" but what a privilege it is to be permitted to rest upon the assurance, "I will go before thee; thou shalt not be without a guide," and "He that followeth Me shall not walk in darkness."—*Hudson Taylor.*

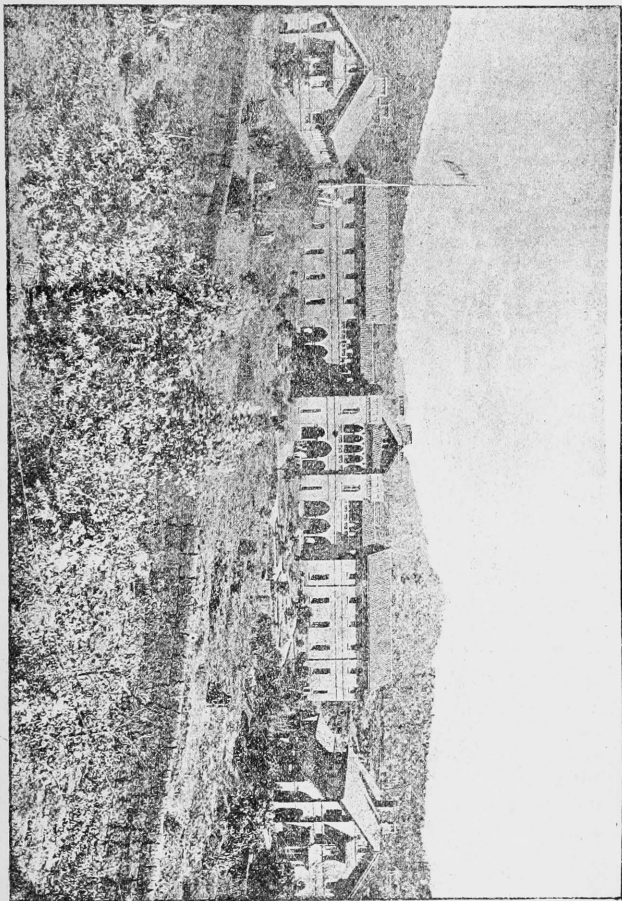
In writing of the evangelistic efforts in connection with the Tung-cho hospital and dispensary, Dr. J. H. Ingram says that he has often thought that the want of clocks in China will certainly be the means by which God will save many souls. One of the most satisfactory results has been the opportunity for work among the women who came to the dispensary. They frequently arrive very early, as they have no means of telling the time at home, and they are usually so anxious for treatment that they err on the safe side and appear an hour or two before dispensing time. One of the Bible women talks with the early comers while they are waiting for the doors to open, and seed is sown in the waiting-room from day to day which sometimes bears visible fruit.—*The Missionary Review of the World.*

The Chinese physician, Dr. George Mark, who was in attendance upon Li Hung-chang on his journey around the world, is a member of the Second Presbyterian Church in Canton. Dr. Henry baptized him and recommended

Doctor's House.

MISSION HOSPITAL AT ANTANANARIVO.

Lady Superintendent's House.



him to the government school in Hongkong, where he was found, when Viceroy Li instituted a search for young Chinese who were qualified to take a medical course in English at the Tientsin school, which Li established. Young Mark was chosen, and did himself great credit, and has been under the patronage of the viceroy ever since. He has the confidence of the Canton Christians. His wife, also a member of the Second Church, is the daughter of a Bible woman now dead.—*Church at Home and Abroad.*

Ambassador Chang, who has been sent to England to convey the congratulations of the Emperor and Empress-Dowager to Her Majesty Queen Victoria on the occasion of her jubilee, has taken with him as physician in ordinary Dr. Tsao Yung-kuei, of the Methodist Episcopal Mission, and Professor of Anatomy in Peking University. We congratulate Dr. Tsao, and are pleased to see in this a recognition at once of the value of Western medical science and of our Christian schools on the part of officials high in imperial favor.

The report of the London Mission Hospital at Tientsin arrived too late to be included in the review of hospital reports for this number of the Journal. But we think it most fitting to include some excerpts from it in this place, especially since the greater part of the report is devoted to the evangelistic side of the work. After paying tribute to the memory of Drs. Mackenzie and Roberts, the writer says:—

“We regard every one who thus comes, as sent, not only to receive healing of his bodily ailment, but also to hear the glad message of salvation through Christ Jesus, the Saviour. We claim them all for the Master’s Kingdom, especially the in-patients; there is, however, absolute freedom of conscience, and be they willing to listen or be they not, we do our best for them.

* * * *

During the year there have been thirty-three baptisms, *i.e.*, twenty-nine in-patients and four out-patients. It is a great joy to have the preaching to the out-patients bearing fruit, and this is in a great measure due to Mr. Chen Yueh-nan, the hospital evangelist.

Before the out-patients are seen, there is always a short religious service, in which the hospital assistants take part. We first have a little prayer-meeting in the consulting-room, and then a text is chosen, and this we make the text for the day: the Gospel in which that particular text may be is the one we sell to the out-patients on that day. We encourage the men to buy a Gospel at the price of six cash, and then the assistants go round and turn

up the text for them. In this way we find that they value the book, and we thus hope to introduce the Gospel into many distant homes where we cannot win the people by personal testimony. During the year we have sold about 7,000 copies of the Gospels, beside a number of other religious pamphlets, calendars, etc. The British and Foreign Bible Society and the National Bible Society of Scotland keep us supplied with Gospels, free of charge, and we here beg to thank them very much for this kindness. Old Fan, who has charge of the book-selling, was seriously ill for a time, but he is now at work again with his usual untiring devotion.

For the in-patients the day begins with morning-prayers, lasting somewhere about one hour; and we make this our one opportunity for teaching them the fundamental truths and facts of Christianity. The assistants, too, teach them every afternoon in the wards. Most cannot read, so we adopt the Chinese fashion and make them repeat aloud and in unison what is being taught, and this fixes the attention of all. They also learn off by heart a few favourite texts, such as John iii. 16, as also some short hymns and the Catechism. Deeply do we realise that nothing but the Holy Spirit's presence and power and touch can bring a human soul from death to life. As we write these lines there is quite a revival in the wards. It is a joy to report that in one of the large wards every patient and attendant has been baptized, while in the other large ward about half have been baptized. Several wish to be; two very nice men seem to have really believed, but are afraid to take this step of confession, and there are a few who are still shutting their hearts to this glorious message of salvation, and for them we shall all pray. Why should one be lost with a Saviour ready and willing to save all that believe in Him?"

The following touching incident is recounted, which shows how Christ-like this work is: "One day my attention was called to a poor lad crouching on the steps of the hospital entrance. He begged hard to be admitted, so we got him carried to one of the wards. An examination showed that he was dying of tubercular disease, and quite beyond hope of recovery. It was touching to see his face of delight as he found himself on a comfortable bed. He was a beggar, but had seen better days. Leaving his home in Shantung he found his way to Peking, and there got employment and managed to save five taels, which he intended to take home as a present to his mother. Sick-ness overtook him and then he tried to go home. He got as far as Tientsin, and for a short time attempted to make a living as a water carrier; but he eventually got tubercular swelling in his knee-joint and that made work impossible, and then he became a beggar. He was an intelligent lad and listened most attentively to the Christian teaching. Latterly he was the occupant of the Bowden Children's Cot. At last it became apparent that a

great change had been wrought in him. One evening, while conducting a religious service in this ward, we were asking those who wished to believe in Jesus to hold up their hands. I had counted nineteen and was looking round, when my eye caught poor Chang's hand sticking out from his bed cover; he made the twenty. Again and again he was asked if he believed in Jesus and had repented his sins, and he always answered in the affirmative. One morning we noticed that he was sinking. I said to him, "Chang, your time on earth is very short, you will soon be in Heaven, where there is no sickness and no sorrow." Then I said to him "Are you afraid to die?" He said "No." "Do you believe in Jesus as your Saviour?" "Yes," he said. We all knelt at his bedside in prayer, and as I prayed he repeatedly broke in with the exclamation, "Jesus K'o Lien Woa" (Jesus have mercy upon me). I then gave him a beautiful white chrysanthemum, and he looked at it with much pleasure as he took it in his hand. During the night he died. Next morning I found him lying there dead with a smile on his face, and one could not help thinking of poor Lazarus."

Correspondence.

CHRISTIAN HOSPITAL,

Nanking, March 30th, 1897.

To the Editor :

For the past year or two I have made a practice of taking most of the sick beggars and tramps I meet on the road side to my hospital, even though I feel sure there is very little or no prospect of life. I tell them, "You can come and die under a roof." If they die I send for the Ti-pao, who sees to the burial. In this way, although in the past year perhaps thirty or more have died, I think at least one-half have lived. One of these poor fellows is now a bright active Christian, and others have learned the truth. It is surely better than the way Dives treated Lazarus, but yet rather unsatisfactory, as it merely palliates a little and does not reach the root of the matter. These poor men go out on the streets again to tramp and beg, and may afterwards die at the door of Dives. Can we not get rid of Dives, or stop his plundering of the poor? Some think that God made men rich and poor, so that there may be charity; but I think this a mistake. So-called charity reminds me of the story of the traveller in the wilds, who had no food for three days, and not desiring to kill his faithful dog, cut off its tail and made some soup. The poor dog eyed it wistfully, and out of charity the master threw the dog a bone of his own tail.

Why should there be so many in the condition of Lazarus, and why should there be such a struggle for existence and many so anxious for the morrow that life is a burden and suicide so terribly prevalent? Jesus said, "Take no thought for your life, what ye shall eat, or what ye shall drink; nor yet for your body what ye shall put on . . . Behold the fowls of the air; for they sow not, neither do they reap nor gather into barns; yet your heavenly Father feedeth them. Are ye not much better than they? And why take ye thought for raiment? Consider the lilies of the field, how they grow; they toil not, neither do they spin; and yet I say unto you that even Solomon in all his glory was not arrayed like one of these . . . Therefore take no thought, saying, What shall we eat? or Wherewithal shall we be clothed? . . . But seek ye first the kingdom of God and His righteousness; and all these things shall be added unto you."

Because the kingdom of God and His righteousness is neglected we have this atheistic struggle for existence and anxiety about this life. Let us consider the birds and lilies and see if we cannot from them learn the righteousness of God that will do away with much poverty. Let us have justice and righteousness to all men first and then charity to supply the lack. Jesus spoke of

wild flowers and birds, not flowers in a pot or birds in a cage; that is, birds and flowers in God's care and not in man's keeping. God does not forget to find his birds, or to water and nourish His plants. Man often does. The Chinese say, "Man is not as well off as birds," and why not? A bird is free. He bathes in God's sunshine and light, drinks of God's rain and streams and lives on God's free earth. All of his environment is free to his use. Some men are slaves and serfs, and thus like birds in cages, or flowers in pots, must depend on other men and cannot get at their proper God-given environment. Others have free sun-light, air, and rain, but the most important part of their environment, the earth, is held by others. If a wild bird only could alight, roost and pick his food by the goodwill of another, he could be impoverished by that other and robbed by rent till he would be as a slave, and we would have ragged and hungry birds. Men robbed of their birth-right, ("The earth hath he given to the children of men"), are driven into dependence on other men, and so lose the privilege of relying on God. Could we make it possible for all the poor and unemployed to get at free land much of poverty would be relieved. Mayor Pingree has for ever demonstrated this in Detroit. But the plan of taking the rent of land for taxes and common uses will make land grabbing an impossibility, and land will be thrown into the hands of the user. If God made the earth and gave it to (all) the children of men, and not to favorites, then the earth belongs to all men living and yet to be born, and so all men are the only landlord. Thus land rent belongs to all men, and this land rent is God's foreordained fund for the uses of society; and God's providence is seen in the fact that when society needs a large common fund, land values—rents—are high, and *vice versa* in the country. Then, thank God, the unholy "survival of the fittest" theory is exploded, and God has provided for all men every good and perfect gift in earth, air and sunshine, and no one should be naked or hungry, as man has thousands of ways of extracting supplies from the great store-house that birds cannot know. Let us rejoice in the fact that when God's righteousness and justice exist on earth, the prayer, "Give us this day our daily bread," will be answered, the genus Dives will be as scarce on earth as in heaven, and Lazarus will cease to be a beggar. Of course, as yet, altruism, which is a Christian feeling, does not exist. Sick soldiers are not as valuable as the general's horse, which would be cared for, but are turned adrift to rot and die, and the poor and unemployed die like dogs on the roadside. We can at present only get all the money we can from Dives to feed and heal Lazarus, and preach our Heavenly Father and His love to all His creatures, and by and bye China may learn to stay the plunderings of living officialdom and dead officialdom (idolatry), land grabbing, usury, pawn broking and the like, and get more directly from His own hand the blessings of God.

W. E. MACKLIN.

Reviews.

化學新編, *Steele's Popular Chemistry.*

Translated by Jno. C. Ferguson, B.A., and Li Sing-yuan.

The original of this book is too well-known to require any notice at this time. It is intended as a popular account of the main facts and principles of chemistry, adapted to the general reader as well as for use in schools. The translators have had both these purposes in mind in the preparation of the present work. Among general readers we would expect it to have a large circulation on account of its plain style, rendering it easier of comprehension than works more technical in character. For medical students it will be found useful as an elementary text-book, and if combined with a work on qualitative analysis, will be found sufficient as a text-book on general chemistry. It will be especially useful to those training hospital or dispensary assistants, where the teachers' time and apparatus are limited. A list, in English and Chinese, of the necessary chemicals and apparatus will be found in the first part of the book, with the address of dealers of whom they may be ordered.

The Chinese style is Easy Wên-li, and while not so difficult as to trouble the ordinary student, yet it is of sufficiently high character to gain the respect of the literary classes. The terms used are largely an adaptation of those used by Fryer and Kerr. Where the translators have seen fit to deviate from these lists and choose terms of their own, it has usually been a change for the better. This is well illustrated in the term used for "affinity," 親和力. Of the old terms, 攝力 expresses simple adhesion, while 愛 expresses a quality of the soul, and it seems irreverent to apply it to

a force existing between atoms of matter, especially as it does not well express the idea. It is unfortunate that the Committees on Nomenclature had not completed their work on Chemical Terms, so that the authorized list might have been used in this work.

The make-up of the book is spoken of as "a new attempt at book-making." It is gotten up in the style of Japanese text-books, bound in cloth, and printed on white, foreign paper; and with clear type, and illustrations equal to those in the original work, it presents an attractive appearance, and as a text-book will certainly last longer and be more convenient than those in the ordinary Chinese style. The price is not out of the way when quantity of matter, style, durability, and general usefulness are taken into account. The original work retails for about three times the cost of this. Another commendable feature is that of the English terms being printed at the side of, or below, the Chinese term in the body of the work, instead of in a glossary at the end. The analytical chart at the close of the book is worthy of special mention, as being the most concise and simple scheme yet translated. Altogether, the book receives our hearty commendation for the purpose for which it was designed.

S.

Annual of the Universal Medical Sciences.

1895. Edited by Ch. E. Sajous, M.D., and seventy associate editors. In five volumes. Published by the F. A. Davis Co., Philadelphia, New York and Chicago.

Any attempt to give, in a short review, an idea of the vast amount of work which has been put into these volumes, or of the

exhaustive completeness of the result, would end in failure. It is a work which every man wishing to keep abreast of his times should have on his shelves, and although it will be most useful to those who have access to large medical libraries belonging to public bodies, where they can hunt up the original paper referred to, yet in all the most important subjects so complete a summary is given of the matter under discussion that, even without such original articles at hand, the *Annual* is of the greatest value. This is especially true in the portions devoted to surgery and gynecology. In all places the illustrations of the incisions for new operations and of new instruments are exceedingly good and helpful. Vol. II. contains an interesting section on "Inebriety, Morphinism and Kindred Diseases" by Norman Kerr, which will give many useful suggestions as to lines of enquiry to those out here, who are investigating the opium habit. Enteric and malarial fevers are the two fevers that most of us chiefly come in contact with, and in Vol. II. they are treated of. A very full account of all the newest suggestions for treating enteric fever occupies seven pages, and contains all a man can want. Under malaria we see the following: "All malarial manifestations are accompanied by melanæmia, which presents itself exclusively in malarial diseases. The sign is therefore pathognomonic, and every suspected case should be examined. A drop of malarial blood shows the masses of black pigment in the plasma. The number and sizes of the pigment-masses are proportional to the degree of malarial poisoning." Yet two difficulties obtrude themselves: (1) that one meets with cases of mixed infection, and (2) the question as to whether the blood of patients living in a malarious country does not constantly, apart from any feverish attack, contain such masses. The finding of the parasite, on the contrary, is certain evidence.

S. R. H.

A Hand-book on Leprosy. By S. P. Impey, M.D. Pp. xv., 116. London: J. & A. Churchill. 1896.

We have examined this work with great interest, because it is not long since we reviewed a work by Drs. Hansen and Looft, relating to leprosy as seen in Norway and Sweden. Dr. Impey, who was lately the Medical Superintendent of the Robben Island Leper and Lunatic Asylums, Cape Colony, deals with the incidence of the disease in South African States, where the conditions of climate are so very different, yet we note that the general results of leprosy are very similar in both these parts of the world. This condition of things corroborates a statement made by Dr. Impey (p. 27), that "no external influences, climatic, telluric, or meteorological, have any appreciable effect on the spread of leprosy."

The authors of both works agree that, practically, leprosy exists in two forms—the tubercular and the anæsthetic, and that there are mixed cases. Dr. Impey, in addition, describes a form, "syphilitic leprosy": five very characteristic plates are given in illustration, and we find that two such dreadfully disfiguring diseases do not neutralise each other; nay, rather they intensify each other's attack upon the system by combining in a terrible partnership. Altogether Dr. Impey gives us thirty-seven splendidly-executed plates, illustrating the disease in its various stages and forms, and adds a map of Cape Colony, showing the geographical distribution of the disease.

This work is a valuable contribution to science. It shows that leprosy knows no distinction of sex, although more cases occur amongst males; but they are more exposed to predisposing conditions. Then we have strong evidence that it is not infectious, and that hereditariness counts for very little. Thus in Robben Island there were 266 leper parents, who had had 951 children, of whom only 23, or about 2.43 per cent., became leprosy. Of 520

lepers in the Asylum, 475 were born of healthy parents; and of the remaining 45 cases, in 25 the father was alone affected, in 16 the mother, and both parents in 4 only. Leprosy may attack all ages—from 3 to 80 years—the average being about 29. About 2,000 cases were estimated to exist

in the South African States. Chapters XIX. and XX. deal with isolation, according to the present system, and suggest some desirable modifications. The regulations framed by government for private isolation are given in the last chapter. —*Bristol Medico-Chirurgical Journal.*



Reports.

HOSPITAL REPORTS.

To the missionary physician who finds his hands full, not only with medical matters but with duties growing out of the evangelistic side of his work as well, the writing of a report comes as a task not easy to perform satisfactorily. If he has made notes during the year for his report, and has plenty of material in hand, he is nevertheless troubled with the question, Who will he write for? Shall it be for his professional brethren, and will he give detailed accounts of his cases and operations, or will he write for the people of the Church which he represents and report the missionary aspect of his work? Many endeavor to combine both and this makes the task a difficult one. No report can faithfully show all the work done or fully picture the interesting features and incidents of a mission hospital. That a large amount of work, benefiting thousands, is being done every day in the various mission hospitals of China, is evident, but some of the best work, that which is most like the work of the Great Physician who went about healing the sick and binding up the broken hearted, can never be reported and will never enter into the statistics of hospitals and societies.

Three hospital reports have come to hand this quarter. The report of the Alice Memorial and Nethersole Hospitals in connection with the London Missionary Society at Hongkong, is an interesting report, although it is not extensive and does not report cases or incidents of the evangelistic work. Five pages are devoted to lists of managing committees, physicians and surgeons connected with the hospital, abstract of Constitution and Connection of the two hospitals and plans of buildings.

Seven pages are devoted to statistics and list of subscribers and four pages are devoted to the work under several heads, such as personal items, referring to changes in the medical staff and hospital management, out-patient department, in-patient department, operations, evangelistic, Samaritan Fund.

The hospitals seem to be very fortunate in having so large a staff of medical men connected with them, among others a dental surgeon, who is reported to have treated 351 patients during the year.

The total number of visits made by out-patients to the hospital during the year was 16,012, and the number of in-patients was 568.

The number of individual cases in the out-patient department was slightly above the average for the past ten years, while the number of in-patients was some less. Eighty-four operations were performed under anæsthesia. Sixty-four effected a complete cure, sixteen gave improvement and four resulted in death.

In the evangelistic work "daily exposition of Scripture is conducted in the out-patient room in connection with every consultation, and in each of the wards there are morning and evening prayers with Scripture reading and exposition, while conversational work is systematically carried on among both in-patients and out-patients. This department of the work is under the supervision of the Rev. T. W. Pearce."

The Samaritan Fund, made up of gifts from friends of the work, amounted to \$76.14 during the year. It is used by Mrs. Stevens, the matron, to meet the cases of need that so often appeal to those in charge of hospitals. Such a fund is an excellent idea. The matron is in a position

to do a great deal of good with such a fund.

"No charge is made for medicines, bedding, clothing during residence, attendance, etc., and only a small proportion of the patients are able to pay for their food."

The expenses of the year amounted to \$8,344.77. The income for the year was \$9,138.59. The list of contributors to the hospitals is interesting, because of its cosmopolitan character. If they are not from every nation under heaven, at least the world is well represented. What but a hospital could so unite the sympathy and philanthropy of mankind. John C. Thomson, M.A., M.D., is superintendent of both hospitals.

From the report of the Tung-kun Medical Missionary Hospital in connection with the Rhenish Missionary Society we learn that building operations conducted during the past year, so interfered with the work that the physician in charge thought it scarcely worth while to issue a report, and the report came out more to conform to the custom previously followed. The report, however, shows a large amount of work done by Dr. Kuhne during the year, and quite justifies its issue. Several new buildings have been added, increasing the capacity, convenience and sanitary advantages of the hospital.

Cholera and the plague had been their neighbors during the year; eleven deaths from the plague having occurred in a house near the hospital at the time of writing the report. Out-patients were seen during eight months of the year on one hundred and ten consultation days, and these made 12,870 visits to the dispensary, or an average of one hundred and twenty-seven for each day. There were sixty cases of leprosy and seven hundred and twenty-two of malarial fever, the greater number of which were of the quartan type.

The in-patient department was open only six months,¹ but during that time two hundred and eight patients were cared for,

seventy-five of whom were women. There were four hundred and fifty-four operations performed, five being for vesical calculus and fourteen for cataract. There are interesting notes concerning the assistants and students, and in regard to the evangelistic work, which we are glad to see is well looked after by Rev. W. Deitrich and two Chinese preachers. Too many hospitals are inadequately supplied with evangelistic helpers. The report contains several interesting incidents of the work, showing the sad and tragic side of this quiet and sturdy people. A list of contributors is added, which shows that the hospital has a generous support from both Chinese and foreigners, while the work seems to be conducted on very economical lines. John E. Kuhne, M.B., C.M., is in charge of the hospital.

The An-ting Hospital in connection with the Peking Mission of the American Presbyterian Church, is under the direction of Robt. J. Coltman, Jr., M.D. The report for 1896 is very brief, but notes an increasing confidence on the part of the Chinese in foreign medicine and the foreign physician. The dispensary is open daily, and the attendance during the year has been very large, being a total of 23,618. May, August and October show the largest daily attendance at the dispensary. There hundred and ninety-seven visits were made by the physician in charge to patients in their homes. He also delivered a course of lectures on the Practice of Medicine to the students of the Tung Wen Kwan, and for a time acted as physician to the Viceroy Li Hung-chang.

The number of in-patients was only eighty-six, which would seem to be a small number for so large an out-patient clientele. The ward accommodations of the hospital are probably limited.

Morning and evening prayers are conducted in the hospital, and daily preaching to the out-patients in the waiting room. There are brief notes on a few cases and a

list of surgical operations which number five hundred and thirty-nine.

It is interesting to note that there is no report of malarial troubles among the natives, although the Doctor himself was ill for six weeks with remittent fever of a severe type, and several other missionaries

are said to "have suffered with malaria, dysentery and other minor complaints." This would indicate that malaria does not enter largely into the troubles met among the natives.

ROBERT C. BEEBE, M.D.



BIRTHS.

At Liao-yang, Manchuria, on 24th Dec., 1896, the wife of Rev. J. M. GRIEVE, M.A., M.B., C.M., of a son.

At I-chow Fu, Shantung, on 13th Feb., the wife of C. F. JOHNSON, M.D., of a son.

At Chang-poo, Amoy, on 4th March, the wife of MUIR SANDEMAN, M.A., M.B., C.M., of a daughter.

DEATHS.

At Chemulpo, Korea, on 3rd Jan., of septicaemia, F. B. MALCOLM, M.D., formerly of the American Baptist Mission, Sz-chuen, and latterly in charge of the work of the S. P. G. at Chemulpo.

At Maquoketa, Iowa, U. S. A., on 16th Oct., 1896, of diphtheria, JAMES J. GREGORY, M.D., for several years connected with the M. E. Mission at Foochow, most of the time being stationed at Ku-cheng.

ARRIVALS.

At Shanghai, on 2nd March, Rev. F. A. KELLER, B.A., M.D., from North America, for China Inland Mission.

At Shanghai, on 13th March, Miss MAUD

KELLAM, M.D., for Canadian Methodist Mission, Szchuen.

At Shanghai, on 27th March, G. W. GUINNESS, B.A., M.B., B.C., and W. L. PRUEN, L.R.C.P. (returned), for China Inland Mission.

At Shanghai, on 11th April, E. R. JELISON, M.D., and family, from Germany, (returned), for Methodist Episcopal Mission, Chinkiang.

DEPARTURES.

From Shanghai, Jan. 9th, R. SWALLOW, M.D., Ningpo, for England.

From Shanghai, Feb. 17th, Miss J. M. DONAHUE, M.D., Foochow, for U. S. A.

From Shanghai, Feb. 26th, H. W. BOONE, M.D., and family, Shanghai, for U. S. A.

From Shanghai, Feb. 27th, MARY GALE, M.D., Shanghai, for U. S. A.

From Shanghai, March 18th, A. W. DOUTHWAITE, M.D., Chefoo, for England.

From Shanghai, April 10th, SYDNEY R. HODGE, M.R.C.S., L.R.C.P., and family, Hankow, for England.

Official Notices.

The following persons have been duly elected members of the Medical Missionary Association:—

CHARLES EDGAR REED, M.D., *Jefferson Medical Col., Philadelphia.*

IDA KHAN, 康愛德, M.D., *Michigan University, U. S. A.*

MARY STONE, 石美玉, M.D., *Michigan University, U. S. A.*

ETHEL N. TRIBE, M.D., *London.*

LUELLA M. MASTERS, M.D., *Syracuse University, N.Y., U. S. A.*

Will the members of the Association please send in their votes on the proposed alterations in the Constitution AT ONCE to the Secretary, Dr. R. C. Beebe, Nanking. Voting papers will be found in the December number of the Journal.

The China Medical Missionary Journal.

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JUNE, 1897.

No. 2.

Original Communications.

[No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editor on the first day of the month preceding that in which they are expected to appear. The editor cannot undertake to return manuscripts which are sent to him. A complimentary edition of a dozen reprints of his article will be furnished each contributor. Any number of reprints may be had at reasonable rates if a *written* order for the same accompany the paper.]

MEDICAL TEACHING IN CHINA.

By JAMES BOYD NEAL, M.D.

In the latter part of 1896 about one hundred and forty circulars were sent out by the writer to the various medical missionaries in China, asking for information in regard to the status of medical teaching in the stations where they were located. To these circulars sixty replies have been received, of which twenty-one report no regular teaching carried on. From the remaining thirty-nine answers the following table, showing the present state of medical teaching and what has so far been accomplished, has been compiled. The first point perhaps which strikes one in glancing over the table, is the pre-eminent position held by our veteran, Dr. Kerr, and his colleagues in Canton in the training of young men and women in medicine. The work of teaching in Canton was begun between 1835 and 1840, and the records are necessarily incomplete, so that the figures in the table are only approximate, more than one hundred in all, according to Dr. Kerr, having been trained. But with all its incompleteness, and taking the figures as found in the table, we see the Medical Missionary Society's Hospital in Canton has helped the Chinese, in the way of furnishing them with physicians trained in foreign methods, four times as much as any other hospital in China.

The next point to be noted is the smallness of the classes taught; there being only five places in all China, including Hongkong, where there is a class of more than ten students, the vast majority consisting of from two to six only. This would seem to indicate that in most instances, even where medical students are reported, the teaching consists in allowing the

students to pick up what they can in daily association with the physician in charge and from more or less desultory reading of medical books, without any very regular and systematic teaching. In other words, that scarcely half a dozen places in China have arrived at the point where they can be really considered to be medical schools. In this connection it is to be noted that no replies have been received from Shanghai, and so far as the writer knows no medical teaching is being carried on there. This seems the more strange when one thinks of the numerous and well-equipped hospitals in Shanghai and of its commanding position as the very centre of China, where one would naturally expect to see a strong central medical school.

It is gratifying to find that in several places the training of women in medicine is being pushed; especially is this so in Foochow, where Dr. Masters has a class of nine, and Dr. Goddard, a class of six. At Foochow and Canton too the women seem to form an integral part of the medical classes.

The general impression made by the returns I think is one of disappointment that so little has been accomplished so far, and yet at the same time of hopefulness for the future.

Interest in the training of the Chinese in Western medicine is evidently increasing rapidly among the physicians in China, and as that interest develops we may look for better methods, larger classes, and altogether more efficient work. The one great difficulty which seems to block the rapid advance of medical teaching is the scarcity of young men and women who have had the preliminary training necessary to the successful study of medicine. We in Shantung have no lack of applicants, but when after a year's sifting we eliminate those who are not able to keep up, we find our classes usually reduced from fourteen or fifteen to five or six. This difficulty of course can only be overcome by the steady growth in the numbers educated in our mission schools and colleges, or by our being willing to take our medical students at a younger age and put them through a preliminary course of physics, chemistry, etc., preparatory to medicine. This latter plan, however, would be quite impracticable in most places where medical teaching is carried on; the difficulty now being to find the time necessary to do the teaching of even the ordinary medical studies. It is the hope of the writer that the publication of these returns may lead to a full discussion in the pages of the *Journal* of the best methods to pursue, books to be used, length of course to be required, etc., in the training of our students. While we may feel gratified that there are to-day probably two hundred and fifty or three hundred students and assistants who are becoming more or less thoroughly trained in Western medicine in our various hospitals, and perhaps three hundred now in private practice, we should, I think, aim at much larger numbers and more thorough systematic teaching.

Location.	Physician.	Total number trained.	Number in Mission Employment.	Number in Private Practice.	Men now in training.	Women now in training.	Total Number already trained and now in training.	Years required.
Canton ...	Dr. Kerr	79	Not known	Not known	18	6	103	3 or 4
Tientsin-Viceroy's Hospital	„ Houston	...	...	...	26	...	26	...
Soochow ...	„ Park	9	5	3	10	6	25	5
Hangchow ...	„ Main	12	7	5	8	3	23	5
Hongkong ...	„ Thomson	7	...	7	12	...	19	5
Foochow ...	„ Whitney	14	2	10	3	...	17	5
Chingchowfu	„ Watson	16	8	5*	None	None	16	...
Foochow ...	„ Masters	6	2	4	...	9	15	6
Moukden ...	„ Christie	9	2	7	6	...	15	5
†Chinanfu ...	„ Neal	10	3	7	5	...	15	4
Peking ...	„ Curtiss	4	2	2	9	...	13	4
Paotingfu ...	„ Atterbury	13	...	13	None	None	13	...
Foochow ...	„ Goddard	4†	None	None	...	6	10	6
Nanking ...	„ Stuart	4	1	2§	5	...	9	5
Changchow ...	„ Fahmy	3	...	3	6	...	9	5
Chungking ...	„ McCartney	3	3	...	5	...	8	5
Sioke... ..	„ Otte	4	...	4	4	...	8	5
Kinhwa ...	„ Barchet	2	1	1	4	...	6	5
Kakchieh ...	„ Scott	3	3	...	3	...	6	4
Ch'aochowfu	„ Cousland	...	...	...	4	...	4	5
Eng-chhun ...	„ Cross	...	...	...	4	...	4	5
Pingtu ...	„ Randle	...	...	...	3	1	4	4
Chinchow ...	„ Brander...	1	...	1	2	1	4	4
Chentu ...	„ Kilborn	...	...	...	3	...	3	4
Miscellaneous	15 places in all	65	22	41	21	1	87	...
		268	61	115	161	33	462	

* Three dead.

† Dr. Johnson, of Ichowfu, assisted in the training of one class of five students.

‡ All dead.

§ One dead.

SEVEN MORE YEARS OF MEDICAL MISSIONARY WORK.

By H. T. WHITNEY, M.D.

The American Board Mission in Foochow celebrated the fiftieth anniversary of mission work here on January 2nd, 1897. In connection with this anniversary the writer was asked to collect some of the more important facts relating to the medical work of the mission since it was established in 1870.

In the issue of this Journal, Vol. 2, No. 3, Sept., 1888, and Vol. 3, Nos. 3 and 4, Sept. and Dec., 1889, the writer briefly reviewed the early history of the medical work at Shao-wu and Foochow, bringing it down to 1889. So at this time we need not repeat, but refer to the beginnings sufficiently to enable the reader to get a connected idea, and then complete, in the same manner as before, the last seven years of our work. To complete, briefly, the first article on the work in Foochow in the September, 1889, issue, it should be added that Dr. White, of the M. E. Mission, was in Foochow from 1847 to 1853, and treated a good many Chinese and gained quite a reputation for curing

opium suicides. Also Dr., afterward Bishop Wiley, first came to Foochow in 1851, and remained until 1853. He was missionary physician, and also did some work for the Chinese. It is hoped the coming Jubilee of that mission will give further particulars of the work of these two gentlemen. This added information will also serve to correct the statement made in my first article that Dr. Welton, of the Church Missionary Society, was the first to begin work here. But it appears that some work had been done three years previous to his arrival in Foochow. From the end of the first decade of mission work until 1870, thirteen years, no medical missionary work as such seems to have been done in either of the three missions.

Dr. D. W. Osgood, of the American Board, arrived in January, 1870, and was the first to begin such work in our mission. He first intended to carry on work in the interior, and made a tour of observation to Yen-ping, 140 miles up the Min, but on his return began work in the city, and toward the end of the year he also started work at Po-na-sang, in the suburbs of Foochow. Here he gradually developed a good hospital work, and in connection with it a large dispensary practice at Ha-puo-ka (Har-poor-care), a densely populated part of the suburbs about fifteen minutes ride in sedan chair from the hospital. For ten and a half years he labored with unceasing energy for the benefit of the Chinese. He died at our sanitarium on Sharp Peak island, at the mouth of the Min, August 17th, 1880.

The last three years of his life he spent all his available time in translating Gray's Anatomy into Chinese Wên-li. He had just completed this work and taken it to the press, when he remarked to a friend, "It has been a question whether the Anatomy would finish me or I finish it, but I have finally completed it and sent it to the press." To accomplish this finishing work he had left the sanitarium and gone up to Foochow for a week, working hard in the extreme heat of summer, and when he made the above remark he was just starting back to Sharp Peak. When he arrived he had begun to be ill, and in a few days passed on to his reward. Thus the finishing of the Anatomy was the last of his earthly work.

March 26th, 1877, the writer arrived in Foochow, and after a month of preliminary arrangements went into the interior 250 miles to Shao-wu, the farthest prefectural city in the north-west of Fuhkien province. Several tours for preaching, book-selling, and dispensing of medicines had been made through this region since 1873, and in November, 1876, Messrs. Blakeley and Walker had moved there with their families and opened a station. Medical work there was first begun in a small way and with the usual difficulties and hindrances.

The first year 2,300 were treated, including those seen during two tours of 80 miles each in different parts of the field. In 1878 a small hospital to accommodate 30 or 40 patients was built, with a dispensary under the same roof.

The hospital was opened in 1879, and the first year 70 in-patients were treated, mostly for the cure of the opium habit. Afterwards through the ill-health of different members of the station the medical work was much broken up and the hospital was eventually converted into school use. The writer was there from 1877 to 1879, made a two months' tour in the autumn of 1881, spent the winter of 1886-7 there, and in the autumn of 1888 again removed there and labored till the last part of the summer of 1891. At the beginning of 1880 we were in Foochow, and relieved Dr. Osgood of a part of his work to enable him to give more time to finishing the Anatomy, and at his death took full charge of the Po-na-sang work and continued there, except during a furlough to America and one winter in Shao-wu, until the autumn of 1888.

In the autumn of 1884 Dr. Kate C. Woodhull and sister arrived in Foochow and began work among women and children in the city.

Native premises were used the first four years, in which time she had an opportunity to get a knowledge of the language and build up a good hospital, dispensary, and bedside practice.

We here begin the review of the last seven years of our work.

1. The American Board Woman's Hospital and Dispensary Work.

After using native premises for four years a site was secured adjoining the doctor's residence and a new hospital erected. It is a very convenient, well ventilated, one story structure, built around an open court, which also furnishes a "sky-roofed parlor" which the patients greatly enjoy. The various wards have 26 beds and a bath-room and hot-water kitchen are attached. There are also students' rooms, an operating room and a chapel. In front next to the street and connected by covered corridors are the dispensary and kitchen. Everything is handily arranged and neatly kept. The annual reports of the work from the first, not previously alluded to, are as follows: Hospital work was begun in January, 1886. During the year there were 40 in-patients and 400 out-patients, first visits. Fees for visits to homes, \$97.13.

In 1887 there were 70 in- and 1,050 out-patients. Fees, \$154.60.

In 1888 there were 70 in- and 1,063 out-patients, 342 return visits and 63 home visits. Fees, \$166.

In 1889 there were 82 in- and 3,161 out-patients, including 143 home-visits and 18 obstetrical cases requiring surgical aid. Fees, \$176.25. This was the year of change from the old to the new hospital, in which there was much better equipment and facilities for doing more satisfactory work.

In 1890 the total number reported was 3,179, of whom 84 were in- and 3,095 out-patients, including 160 home-visits and 15 obstetrical cases requiring surgical aid. Surgery, 57. Fees, \$150. Students, 5. In 1889 a new

kind of work for this region was started, namely, the curing of the opium habit through prayer and instruction in religious truth. The patients were required to attend regularly the evening services at the church and receive instruction in the truth and be taught to pray. After showing their sincerity by thus attending regularly for two weeks they were then taken to the woman's dispensary for some medicine. Some have been cured, and are holding out well, and five have been received into the church. The 1891 report gives a total of 4,595 patients, including 90 in-patients, 80 home-visits and 20 obstetrical cases. Fees, \$162.40. This year was the first to graduate students. Four received diplomas, or certificates, showing they had completed the required studies; one was too ill to attend the exercises, and died of phthisis soon after; one of the others remained to assist in the hospital, and the other two went out to engage in private practice. There was one student left, and others were received to fill the places of those who were graduated.

Early in 1892 Dr. Woodhull, having been failing in health, went to America for rest. The hospital had to be closed, but the dispensary was continued by the native assistant, until Dr. Woodhull's return in Nov., 1893, accompanied by Dr. Frances E. Nieberg, to be associated with her in this work. The 1894 report gives a total of 5,547, of whom 77 were in-patients and 323 home visits. Fees, \$157.97. Medical class, 5. This report includes three months of outside dispensing to 1,143 patients. Four out-station dispensaries were opened to extend the work in 1895. The report of 1895 gives a total of 6,481, including 119 in-patients, 2,241 out-station dispensary patients and 645 home-visits, of whom 18 were difficult obstetrical cases. Fees, \$304. The medical class continued with 5 students, with two native teachers to aid in their instruction. This report shows a perceptible advance in all the departments of the work. The 1896 report, bringing the work down to March 31st, 1897, gives a total of 7,565 made up as follows: at hospital dispensary, 5,636; at one out-station dispensary, 852; home visits, 839; foreign patients, 98; in-patients, 122; obstetrical cases, 18; surgery, 230; students, 6. This again shows an advance over 1895. In March, 1896, Dr. Woodhull and sister returned to America, leaving the work of this last year wholly in the care of Dr. Nieberg-Goddard (this last name was added Nov. 27th, 1895). The above gives a brief outline of the growth of this work for thirteen years. The regular routine work has been much the same as in other works of this kind. At the hospital dispensary four days were given to the clinical work and two days (Wednesdays and Fridays) were reserved for operations and special instruction of students. Daily religious services are held in the chapel, and besides special efforts are made in the wards and with dispensary patients to enlighten them in regard to divine truth and to seek to lead them to embrace this truth that they might enjoy its benefits.

Great good has been accomplished in this way over and above all the physical benefits. China thus owes a great debt of gratitude to lady physicians for the benefit they have been to her people.

2. Shao-wu Medical Work. (Continued.)

As before stated we removed to Shao-wu in November, 1888, and resumed medical work again, though in a very limited way, owing to the pressure of other duties made necessary by our small missionary force at this station.

Most of the work was at the dispensary, though many home-visits were made in the city and suburbs, and some were treated while on tours. The Third Report, to March 31st, 1890, gives 3,246, of whom 665 were return visits. Surgery, 132. Assistants, three. These were young men whom we had taken to Foochow in the spring of 1887 to keep them under instruction preparatory for future service in the Shao-wu field, and they returned with me in 1888. No systematic instruction could be given in 1889, owing to lack of time and constant interruptions. During 1889 the writer completed the revision of the Anatomy and the Vocabulary, and printed a second edition of 1,000 copies. A Primary Physiology was also prepared and printed in the Foochow colloquial for use in day-schools.

The Fourth Report gives 4,501 patients, of whom 547 were return visits. Surgery, 267. Assistants, three, and two students were added and regular instruction given a part of the year. This year was marked by having ten cases of obstetrics, some of them severe; one had convulsions and one required craniotomy. The mothers were all saved, but four of the children were lost, three being dead on our arrival and the other starved to death. The fifth and last report, while under my care, gives 2,000 in all, and surgery, 200. The increase of other duties compelled us to leave most of the medical work to the assistants, aiding them only in difficult cases. The work of this year was also broken up by a scare of rebellion from the Ko-lau-huei Society, and we were advised to return to Foochow, which we did at the end of summer (1891). As affairs turned we only returned for a tour through the field in the following spring and then went to America on furlough.

The medical work, except what was done by the assistants, thus came to a halt until the arrival of Dr. E. L. Bliss at the end of 1892.

In 1893 Dr. Bliss began the study of the Shao-wu colloquial, and from press of patients soon opened a dispensary in the lower room of his own residence. But this arrangement was unsatisfactory in several ways, and in 1894 a small room was fitted up for a dispensary in connection with a book-building. This was also unsatisfactory, but has had to be continued thus till now.

As yet Dr. Bliss has had no conveniences for receiving in-patients, and being obliged to be away from the station a good deal he has been unable to

make any considerable start in the medical work there. He, however, has made several dispensing tours through the Shao-wu field, and made quite a large number of home visits besides those treated at the dispensary. From the time of his arrival until the end of January, 1897, he has treated 10,309 patients, of whom 1,342 were return visits, 924 home visits, and 800 were treated on tours. Surgery, 229; assistant, one; and student, one. The average of dispensary patients has been 20 each clinic.

Shao-wu has always been a difficult place in which to build up a prosperous medical work, owing to the frequent interruptions by the physician having to leave the station for a longer or shorter period and by not having any resident physician for several years,—from 1880 to 1888. And yet a very commendable amount of useful medical work has been done under these trying and difficult circumstances.

3. Pagoda Anchorage Medical Work.

This place is the anchorage for foreign vessels to the port of Foochow. It is ten miles below Foochow and 15 miles from the mouth of the river (Min). It is the entrance to the very populous Chang-loh district, which has been worked by the American Board Mission since 1863. In 1891 a station was opened at the Anchorage, and in December, 1892, Dr. Kinnear began dispensary once a week at the village of Yang-seng near by. When the writer returned from America in November, 1893, he took over this work, and has continued it until the present time. Dispensing trips have been made to different parts of the field and irregular work has, also, been done at some of the out-stations.

But most of my time has been required in the religious and school work, and the medical has been done more to meet the immediate needs of those near at hand, the severe cases for lack of conveniences here being sent to Foochow to either the men's or woman's hospital, so that during the three years of this kind of work the total recorded is only 2,677 and surgery 330. This station has an estimated population of 500,000, and with sufficient means and a proper equipment a medical work might be developed here equal to any in Foochow.

4. The Po-na-sang Medical Work. (Continued.)

In the autumn of 1889 Dr. H. N. Kinnear arrived, and in January, 1890, took charge of the medical work in connection with the study of the language. This was not an easy undertaking for one to whom the language, the people, and work were all new, but with the aid of an efficient assistant he got on very well.

The Eighteenth Report, the first of Dr. Kinnear's, gives 9,772 patients, of whom 336 were in-patients and 5,290 return visits. Surgery, 627. The Chinese help was three assistants, three students and a hospital evangelist. Rev. G.

H. Hubbard assisted in teaching anatomy and physiology. The Nineteenth Report gives 8,456 patients; 4,414 were return visits and 234 in-patients. Surgery, 498. The number of students was the same, and the evangelist was continued. The Twentieth Report gives 11,675, of whom 7,321 were return visits and 284 in-patients. Surgery, 696. In the summer and autumn of this year (1891) occurred one of the severest and most prolonged cholera epidemics ever known in this region. And in November, as Dr. Kinnear and family with two other families, was moving to Shao-wu for a temporary sojourn, Mrs. Kinnear was taken ill with this dread disease, and succumbed after four days suffering, in a small "up river" boat. Dr. Kinnear and his little son were taken ill, but their attacks were much lighter, and they gradually recovered.

This year there was no evangelist, and the students were reduced to three, one having died and two unpaid students discontinued their stay at the hospital. During this year, also, Dr. Kinnear began the use of introductory letters. These were given to patients, leaving the hospital, to take to the preacher, of whatever denomination, located nearest to his home. This was a good plan, and some good came of it. The Twenty-first Report gives a total of 15,078, of whom 9,617 were return visits and 420 were in-patients. Surgery, 753. Two students had been added, making five in all, and a new evangelist had been secured. This year, also, Dr. Kinnear received two laudatory tablets. Probably all medical missionaries get their share of these tablets. The writer has long discouraged this waste and the giving of the money which could be used to benefit others. Others, also, have done the same, with good results.

The Twenty-second Report gives 14,776 patients, 9,567 of whom were return visits and 364 in-patients. Surgery, 871. Students, 5. One death in hospital. Dr. Kinnear was ill part of the time to which he attributes the decrease in attendance over that of the year previous.

The Twenty-third Report gives 14,384, of whom 9137 were return visits and 403 in-patients. Surgery, 820. Deaths, four. This report contains a new cut of the Po-na-sang hospital and a picture of the seven assistants and students, two of the latter having been received near the close of the hospital year. One of them was a graduate of our Boys' Boarding-school. The giving of the introductory letters to patients returning home has been continued, but the results were not what ought to be expected, owing perhaps to the preachers not understanding the design of them.

The Twenty-fourth and last Report by Dr. Kinnear before returning home on furlough, gives 14,614, of whom 9,790 were return visits and 205 in-patients. Surgery, 773. Death, 1. At the beginning of 1896 four of the students were dismissed for one cause or another, retaining one assistant and two students. At the close of this hospital year (March 31st, 1896), Dr. Kinnear


and family went to America, and the Po-na-sang medical work was put into the care of the writer.

The Twenty-fifth Report, yet to be printed, will bring the work down to March 31st, 1897. The total for the year is 14,130, of whom 9,195 were return visits and 325 in-patients. Surgery, 784. Deaths, 3. Chinese help is one teacher, one assistant, two students and an evangelist. Twenty of the in-patients had the opium-habit, and were cured of it at the same time as of their other complaints.

We have now given a cursory view of the various branches of our medical work for the past seven years, thus completing its history from the beginning in 1870. There are many items of interest that might be gathered from the reports of these twenty-seven years of labor, but the limits of this article will not allow of it.

The combined period of the four gentlemen and two lady physicians who have been appointed to this mission, amounts to nearly fifty-seven years, viz., Dr. Osgood, 1870 to 1880, ten and one-half years; Dr. Whitney, 1877 to 1897, twenty years; Dr. Woodhull, 1884 to 1896, twelve years; Dr. Kinnear, 1889 to 1896, six and one-half years; Dr. Bliss, 1892 to 1897, four and one-third years; and Dr. Nieberg (afterward Nieberg-Goddard), 1893 to 1897, three and one-third years. After deducting furloughs we still have over fifty years of continued service for one physician.

Statistics.—In the earlier years of the work no special attention was paid to keeping exact records of what was done. And in later years there have been many omissions under different headings, so we cannot give as complete statistics as we would like. But in general, combining the Po-na-sang, city, Shao-wu, and Pagoda Anchorage works there were over 291,000 cases since the beginning of the work in 1870. Of this number over 93,000 were return visits. Over 10,800 were in-patients, including 2,100 or more opium cases treated in the opium asylum. The out-patients also include several thousand visits to homes, several hundred cases of suicide, mostly with opium, and about 200 cases of obstetrics, mostly difficult ones. About half of these belong to the women's hospital work. In conclusion, to one who is familiar with all but the first seven years of the Po-na-sang work, these figures mean a great deal, even years of hard work, suffering, sickness, and to one of the number, death. But looking at the hundreds of lives that have been saved, the myriads that have been healed, and the many souls that have been saved, we could wish that even more could have been done to rescue and uplift this sin-cursed and down-trodden people.



CONGENITAL STENOSIS OF THE ŒSOPHAGUS.

By HORACE A. RANDLE, M.D.

On April 7th, at 3 a.m., a baby boy was born under our medical care. Presentation and delivery were normal, with the exception of the umbilical cord being tightly twisted round the neck of the fœtus. This pressure we lessened by a finger as soon as the head was born, until in a few minutes we were able to pass the funis over the head. When the birth was complete, we missed the vigorous first cry of the newly-born, which every accoucheur delights to hear; and in its place only a sorrowful little fretting was given, but faint attempts at crying. A considerable discharge of frothy mucus took place, from both mouth and nostrils, somewhat embarrassing respiration. In other respects the child seemed normal; the weight being 7 lbs., minus 2 oz.

During the second and third days he seemed hungry, and attempted with some little vigor to take his food, but always choked within the first minute. He only passed, in scanty motions, the greenish-black meconium from his bowels, and urinated but thrice. He now began to show marked signs of falling off, and I concluded that something was wrong with his power to feed. His breathing was shallow, between 40 and 50 in the minute, rough and bronchial in character, though there was considerable expansion of the upper part of the chest, especially antero-posteriorly. His pulse and heart sounds were normal, but becoming feeble.

On the morning of the 5th day I had reached no certain diagnosis, and felt anxious about him. We fed him with milk and Valentine's Meat Juice diluted with water, very slowly and gently by the mouth with a medicine dropper; still he choked and threatened to suffocate. We then gave a rectal injection of half a fluid ounce of his mother's milk with 4 and 5 drops of brandy. This last he retained, but an hour later he became cyanosed, and with a faint struggle respiration ceased. Putting him down on his back upon the carpet before the fire I restored breathing again by artificial respiration, applying *Liquor Ammoniaë Fort.* diluted with an equal quantity of water sprinkled over a handkerchief to his nostrils, but it was several minutes before I could hear the heart-sounds again. Upon staying my efforts respiration threatened to cease, so I continued to maintain, (or to assist), respiration by artificial action for about an hour; by which time both breathing and the heart's action were well established. He lived seven hours longer, and it was during this time that I confirmed my suspicions as to what was wrong.

I tried patiently and carefully to reach the stomach *viâ* the mouth, using five catheters of different sizes and of different degrees of firmness, but

they all stopped at the same place about half way down the œsophagus, and I could by no means induce any one of them to go further down than a point about $2\frac{1}{2}$ inches above the entrance to the stomach.

It seemed to us that the question of an operation offered no chance of saving his life, and he died at the age of 5 days and 15 hours. I am sorry I could not have a post mortem examination to demonstrate the diagnosis, but every symptom pointed to congenital stenosis of the œsophagus, and I am of opinion that the larynx or trachea was not normal.

Perhaps in view of the fact that such a case is happily extremely rare, I may be permitted to recapitulate the symptoms as I found them :—

1. Frothy mucus from mouth and nostrils, persistent and continuous; best removed by inverting the child.

[This of course would indicate inability to swallow].

2. Constant and almost immediate choking, when and however fed.

3. Total absence of vomiting, or attempt at vomiting, though all food *would be* returned by choking, or *could be* returned very readily by inversion.

4. Stools (of which there were 10 or 12) never deviated from the greenish-black meconium, though they became more and more scanty.

5. Urination rare, only three times in $5\frac{1}{2}$ days.

6. No probe could reach the stomach *viâ* the œsophagus.

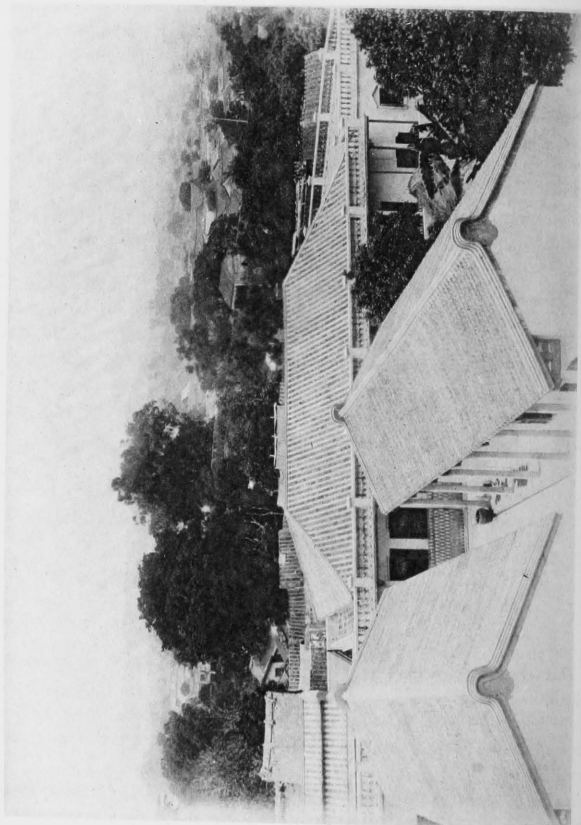


LIGATION OF THE RADIAL AND BRACHIAL ARTERIES FOR TRAUMATIC ARTERIO-VEINOUS ANEURISM.

By J. H. McCARTNEY, M.D.

The patient was a man about middle age, a physician by occupation. Nineteen years ago he had his hand lacerated by the premature explosion of an anvil that he was loading to celebrate a marriage feast. The hand healed slowly, (as such wounds always do under native treatment). After it healed he had perfect use of his hand; but on the radial side involving the thumb, index, and middle fingers, extending from the tips of the fingers to about the middle of the forearm was an immense arterio-venous aneurism.

When he kept his hand elevated he suffered no inconvenience, but as soon as the hand was lowered a swelling of the superficial veins took place, attended by great pain. On elevating the hand again the pain and fullness disappeared. By compression of the brachial artery at the bend of the elbow all fullness disappeared.



BURNS' MEMORIAL HOSPITAL, CH'AO-CHOW-FU.

After consultation with Dr. Wolfendale, of the London Mission, we decided to first ligate the radial artery, as there would be less danger of gangrene than if we ligated the brachial. The patient was prepared in the usual way, after which we ligated the radial in the upper third near where it branches off from the brachial. This ligation unexpectedly produced no effect on the pulse at the wrist, this probably being due to the collateral circulation having been established almost as soon as the circulation had been cut off in the radial. In view of this fact we decided to ligate the radial in its lower third, which was quickly and easily done before the man had come from under the influence of the anæsthetic.

The wounds were closed and bandaged. The dressing was not changed for five days, at the end of which time we removed the stitches, the wounds having healed by first intention.

The condition of the aneurism was not materially changed by this operation, with the exception that the pulsations were less distinct than before. At the end of ten days we decided to ligate the brachial at the bend of the elbow. An incision two inches in length along the inner edge of biceps tendon was made; its centre corresponding to the fold of the elbow. The artery was ligated in two places with large-sized catgut, and the wound closed. The patient complained of a slight numbness of the fingers, which felt cold to the touch for a few days. These symptoms were treated with external heat, and they passed off in less than twenty-four hours. The patient made a good recovery, and left the hospital a few days after the operation.



THE BURNS' MEMORIAL HOSPITAL, CH'AO-CHOW-FU.

By PHILIP B. CUSLAND, *M. B. C. M.*

This hospital was built by the late Geo. Barbour, Esq., of Bonskeid, Scotland, in memory of his friend, the Rev. W. C. Burns, the first missionary of the Presbyterian Church of England, who was arrested at Ch'ao-chow-fu in 1856 while on a preaching tour, and sent from there overland to Canton as a prisoner.

As far back as 1883 attempts were made through native agents to rent a house for a dispensary, but few owners were willing, and of the few none dared. In 1888 I began dispensing in our tiny chapel to crowds of patients. In a fortnight one man plucked up courage to rent us a dilapidated tea ware-house in Tiger's Tail Lane, which, being in the immediate neighborhood, was taken possession of without trouble. Here we enjoyed great popularity. Patients

were seen daily, and the numbers had eventually to be limited to 100 a day to allow time for operations, etc. We were cheered too by sincere inquirers, and the two best local members of the Ch'ao chow-fu church were the first two then converted. After six months we were able, through a grateful patient, to rent a much better place, and although the neighbors raged and fumed at first, we took possession without serious trouble, and our most furious foe became our best friend.

But this situation did not prove a good one and any way the "boom" that so often attends the opening of a new place in China was passing off, and the attendance at the dispensary was a good deal lessened. We worked here for a year, when the place was sold over our heads. Thereafter until the hospital was built dispensing was carried on in rented Chinese houses, which served also as dwelling houses. It was not until 1890 that a suitable site, whose owners were willing and bold enough to sell, was found.

That year was spent in futile negotiations. In 1893 the price was agreed upon, but opposition arose, our enemies speaking through the authorities. Even the viceroy wired 萬萬不可.

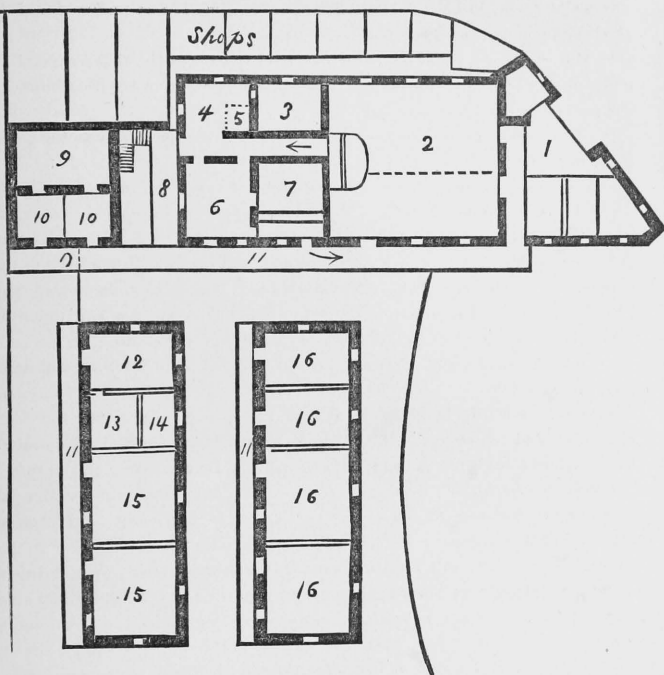
The owners proved their title to the land in the courts, and we refuted the objection that the people would not allow it, by dispensing on the spot for several months without hearing an angry word. For some time I was in daily medical attendance on Taotai Tseng, who proved friendly, but professed himself unable to remove the obstacles and have the deed stamped. A short piece of boundary wall built in January, 1894, was thrown down during the night, and when rebuilt was again partially thrown down, but boundary stones put up by us were not molested. That autumn we decided to risk building. All went on quietly, and when the roof was on the first block, victory was assured. Hospital and dwelling house were finished in the spring of 1896.

The situation is a capital one, being on the bank of the river facing the summer winds, and yet being quite near the South Gate of the city and easily found by both country and city people.

The plan annexed speaks for itself. The main door way opens on the embankment street. It is in the style of the native hong entrances. The decorations are thoroughly Chinese, and are in color relief. A sliding barred gate enables the porter to see who seeks admission and prevents the place being rushed by undesirable characters.

Two doors behind the pulpit allow the admission of men and women separately, so that there is no intermixing.

The walls of the building are all of lime and sand concrete, as customary in this region. The roofs are tiled and the floors laid with Portland cement. The courts are concreted. The drains are U shaped on section, and there are no corners in any of the rooms; the angles where floor and wall join, at the corners of the room and where the wall meets the ceiling, being all rounded off.



PLAN OF THE BURNS' MEMORIAL HOSPITAL, CH'AO-CHOW-FU.

1. Front hall with porter's, students', and reception rooms.
2. Chapel and waiting room divided by screen.
3. Store room.
4. Dressing and minor operation room.
5. Ophthalmoscopic room.
6. Consulting room.
7. Dispensary.
8. Dressing verandah, (ulcers, etc.)
9. Latrine.
10. Bath rooms.
11. Verandahs.
12. Kitchen.
13. ,, store room.
14. Cook and coolie.
15. Women's wards, 20 ft. x 20 ft.
16. Men's wards.
17. Door into women's side.

There is a second storey on the men's block containing 4 more wards.
There is ample accommodation for 16 women and 50 men.

The walls are whitewashed; an attempt at hard finishing having failed to produce a non-absorbent surface.

The rooms are ceiled and the roof lofts ventilated through from end to end and also with lateral openings. This prevents decay in the wood work of the roof and keeps the rooms below cooler.

Fly gauze windows have recently been placed between the venetians and glass to allow ventilation and keep out the mosquitoes. It is hoped the need for mosquito curtains will thus be obviated. A second storey on the men's ward has recently been added. The wooden floors were oiled with raw hot nut oil, and then a second coat of cold boiled oil laid on. Simple ventilating holes were put near the ceiling. The hospital was planned with a view to the future. It is painfully evident in many mission buildings that the exigency of the time and not the growth of the future was in the designer's mind and so when the need for extension comes it is found that the edifice does not lend itself to enlargement, and additions have to be stuck on in the least objectionable way possible.

It is better to plan largely, and as the money allows and the need demands build bit by bit. Not that the plan of this hospital is my ideal. The shape of the ground forced it into the present form.



I. CONCERNING THE DECREASE OF MYOPIA BY THE REMOVAL OF THE CRYSTALLINE LENS.

By Prof. J. HIRSCHBERG, *Berlin, Germany.*

Translated by E. RUEL JELLISON, M.D., Chinkiang, China. After an address given at the Ophthalmological Society of Berlin, Germany.

If one removes the lens from an eye with myopia of 24 dioptries, and subsequently finds a myopia of 1.5 dioptries, then the difference (U) between the first or original condition of the refraction and the second or succeeding condition of the refraction amounts to

$$U = R_1 - R_2 = 24 - 1.5 = 22.5 \text{ D.}$$

It was a curious error of many colleagues to consider the size of U as fixed. The size of U is, according to its nature, necessarily a variable one, and increases in a lawful manner with the number of dioptries of the original myopia, even if we assume, for the sake of simplicity, that all strongly myopic eyes operated upon, possess exactly the same refractive media as an average emmetropic eye; that the increase of the myopia is solely and alone caused by the lengthening of the visual axis.

Under this hypothesis there accrues to the lens possessing eye by increase of the visual axis of one mm. constantly a myopic augmentation of 3 D; but to the aphakic eye one of some 1.5 D. If the visual axis is lengthened by a definite number of millimetres, for instance, of five mm., there is produced therefrom, in a lens possessing eye, a myopia of $5 \times 3 = 15$ D; in an aphakic eye only an increase of the refraction of $5 \times 1.5 = 7.5$ D. The greater, also, the original myopia, the greater the loss in efficaciousness of the increase of the visual axis in an eye which has become aphakic, the greater also the difference U. It is even so as if a man exchanged current money into foreign; the greater the amount exchanged the greater the loss.

We will ascribe an even 24 mm. (instead of exactly 23.8 mm.) as the visual axis of an average emmetropic eye; by removing the lens it acquires a hypermetropia of 10 D, if we bring the spectacles in the anterior focus of the corneal system, that is, $3 \times 7.75 = 23.25$ mm. in front of the cornea. If the normal emmetropic eye is increased in length 1 mm., then the length the visual axis is brought to 25 mm.; and thus the eye has acquired a myopia of 3 D. If one removes the lens from this eye, then it has $H = 10 - 1.5 = 8.5$ D, because in aphakic eyes an increase of the visual axis of 1 mm. brings about an increase of refractive power of 1.5 D. We obtain, therefore, according to my simple and approximate computation the following synoptical table:—

<i>Length of visual axis</i> A.	<i>Refractive condition of lens possessing eye</i> R_1	<i>Refractive condition of aphakic eye</i> R_2	<i>Difference between R_1 and R_2</i> U.
24	E.	H 10 D	10 D
25	M 3 D	H 8.5 D	11.5 D
26	M 6 D	H 7. D	13. D
27	M 9 D	H 5.5 D	14.5 D
28	M 12 D	H 4. D	16 D
29	M 15 D	H 2.5 D	17.5 D
30	M 18 D	H 1. D	19. D
31	M 21 D	Almost E.	21. D
32	M 24 D	M 1.5 D	22.5 D
33	M 27 D	M 3. D	24 D
34	M 30 D	M 4.5 D	25.5 D

One perceives this simple law, which follows from the preceding:—

$$Ux = \left(10 + \frac{Mx}{2}\right) D,$$

that is, for an eye with myopia of x dioptries, the difference U, produced by the removal of the crystalline lens, will be equal to the sum of the difference

for the normal emmetropic eye ($U_0=10$ D) and the half of the original number of dioptries of myopia of the case.

Example: For an M 20 D will $U_{20}=\frac{20}{2}=20$ D. An eye with M=20 D will, by the removal of crystalline lens, become nearly emmetropic.

It is very important to first compute the R_2 and this may easily be done mentally. That is to say, the second condition of refraction which remains after the removal of the crystalline lens R_2 (x), for an eye with M=XD is found by subtracting from R_2 of the normal emmetropic eye (that is, of H 10 D) one-half the number of dioptries of myopia of the eye operated $\frac{M_x}{2}$.

$$R_2 (x)=(+10-\frac{M_x}{2}) \text{ D.}$$

Example: For M_{20} will $R_2=(+10-\frac{20}{2})=0=E$.

The approximate computation agrees satisfactorily with the actual experience.

My eight operations for decreasing myopia have yielded me the following figures:—

No.*	Age	R_1	R_2	Vision	
				Before operation	After operation
1	7	M 15 D	H 2 D	1/10	1/4
2	8	M 16 D	H 3 D	1/5	1/3
3	13	M 16 D	H 2 D	1/6	5/9 to 5/6
4	22	M 18 D	Nearly E	1/12	1/4 (old leucoma)
5	28	M 20 D	" "	1/10	1/4
6	29	M 20 D	" "	1/12	1/5†
7	30	M 23 D	M 3.5 D	1/7	5/9 to 5/6
8	39	M 26 D	M 3. D	1/12	5/9 to 5/6

The agreement of the observation with the computation is so great that only a small value can be ascribed to the deep lying, or peculiarity of the lens (for instance a more spherical form), or even to the peculiarity of the entire refractive apparatus, in contrast to the elongation of the visual axis of high grade myopic eyes. More importance must be attached to the length of the visual axis than to the condition of the refractive media. Still it is far from my idea to detract from the influence of the depth of the lens as colleague Schön has done, when it lies unusually deep. I also acknowledge that the deviation of the corneal curvature from the average, has an influence. As practical results the following can be noted: M of 18—20 D will by removal of the lens, be nearly changed into emmetropia. In M 15—16 D a light hypermetropia of some 2 D is to be expected. In M 23—25 D there remains a moderate myopia of some 2—3 D. In M 30 D there remains behind an average myopia of about 5 D. That satisfied perfectly.

* This arrangement is not chronological, but according to the degree of myopia.

† Later had detachment of the retina.

Complete exactness cannot be attained by the spectacle test, as sometimes these patients, from the nature of their eyes, do not possess normal vision, and during repeated tests by no means always make exactly the same declarations, neither before nor after the operation, and especially not in the time immediately after the healing, following the operation.

I had certainly retained my simple computation for myself, if a marked obscurity did not still rule in the literature, so that when one speaks of the average size of U, there is no such, and it cannot be given; and if the profound discussion of colleague Schön, in the January number of the *Centralblatt*, had not unfortunately remained unconsidered by a very great number of colleagues. The above selected presentation impresses itself easily upon the memory, and can be made of use in text books.

In addition to my computation one may perhaps expect from me some clinical observations concerning the operative removal of myopia, above all a justification of the fact, that, I so far have performed only eight operations, when from my number of patients I could easily have performed 100. Now I do not belong to those, who, as colleague Cohn, are convinced that Vincenz Fukala should be grouped with those great benefactors of the eyes of men—Helmholtz and Albrecht von Graefe. Such extravagance works an injury to the very essence of the matter, although I acknowledge the actual services of Fukala which I value in the highest manner. I am unable, with other excellent colleagues, to place the operation for myopia above that for cataract or glaucoma. There will be much more accomplished by the last two mentioned operations in my hands than by the operation for myopia.

The matter was also not so new to me; for, looked at apart from the cases reported in the journals, I had in fact long before seen operated cases, which moreover were by no means always happily terminated for the patient. Then the later results were too unfortunate, as Fukala in the most meritorious manner fought down the prejudice against the operation.

The results of the operation on seeing eyes of young people were worse than the operation on eyes blind from cataract in old people. More cases of infection were published. All those which remained unpublished are withdrawn from critical review. Still cases of infection have fallen to the lot of the best operators. The declaration of colleague Cohn, that suppuration of the eye is withal excluded, is certainly incorrect. But it is exactly this danger that I fear the least myself. I have operated over 200 lamellar cataracts, where the procedure is exactly the same as against myopia, but never therefrom lost an eye, and never once experienced an infected wound, not even in earlier times when our treatment of wounds unfortunately had very much in it to be desired. *Much worse for me is the danger from detachment of the retina.* Such an excellent and careful operator as Sattler found it in 4 out of 65 cases, which is nearly 7 %, and this is only our lowest margin,

because our time of observation is still short. I know also that other excellent operators have observed detachment of the retina in 10 % of their operations. This was the per cent. of loss by flap extraction in the beginning of our century. I have operated numerous highly myopic eyes for cataract (occasionally with only infinitesimal opacity, whereby the usefulness of the eye had been arrested) and never have seen a subsequent detachment of the retina. Therefore the detachment of the retina depends, according to my view, upon the incorrect methods of operating, *especially from the numerous dicissions into the vitreous*. Then the idea that the detachment of the retina, after the operation for myopia, stands in no causal connection with the operation, or that in some eyes operated for myopia the detachment of the retina would have occurred in the absence of the operation is too little scientific and practical to be seriously considered. What takes place in connection with our operation we must consider as a result of the same: only then we can learn to avoid it. I have selected, so far, only such cases for operation that on the one hand were perfectly helpless without the operation, for instance, children who were not in condition to go to school alone, a teacher who could not earn her bread, a doctor who was unable to do his work, people who on account of the excessive myopia had no enjoyment from life; and that on the other hand, offered me security that I could have them completely under observation until healing. Ambulant treatment seems to me reprehensible, even if the trial in several cases does not prove unsuccessful.

Also the enthusiastic delight of grateful patients over the successful results, which have been brought to me, both orally and written, have not been able to diminish my anxiety in regard to the subsequent cases. Since I have simplified the operation for myopia, and as I believe thereby improved it, I have determined to use it more frequently. I constantly seek to retain the round pupil, and in children complete with one, in adults with two operations. In children after dilatation of the pupil, I make an average laceration of the capsule and the superficial layers of the lens. Under the moderate use of atropine, complete absorption of the lens takes place. This procedure has become familiar to me from operating lamellar cataract. When the dicission is too small it leads rather to an irritation without perfect absorption. But if a severe swelling and increase of tension occur, then the lens masses must be removed by the lance incission. In adults I make a dicission and, after four or five days, before an increase of tension has occurred, a corneal flap incission, out of which the lens comes easily and completely. If one only makes the commonly described lance incission, large portions of the lens remain behind; if we lacerate the same, it leads to renewed swelling and highly annoying increase of tension, the continual employment of Physostigmine, yea, even iridectomy may be demanded; for the renewed evacuation of the lens fragments would now, where a dicission had already been made into

the vitrious, cause the danger of prolapse of the vitrious, which, in these eyes, by all means must be avoided. I have myself never seen vitrious in my operations for myopia, but still in a case where four operations were made, I unfortunately saw a subsequent detachment of the retina. I am convinced by a direct examination of several patients operated by others, that detachment of the retina cannot only ensue, as is known, through prolapse of the vitrious, but, *also through too numerously aggregated dicissions into the vitrious.*

THE TREATMENT OF CHOLERA BY INTRAVENOUS SALINE INJECTIONS.

By ROBERT H. COX, F.R.C.S.

It is doubtful whether the immediate treatment of cholera is any more successful now than it was sixty-five years ago, for, notwithstanding the advance made in the treatment of almost every other disease, the mortality of this remains the same—death still claims about one-half of those attacked.

The number of remedies recommended from time to time is legion, and forms a veritable museum of strange methods. Even a list of these would occupy too much space, but it would include most of the drugs of the pharmacopœia; insufflation of air; tight bandaging; injection of the bladder, of the large intestine, of the peritoneum, and of the veins; bleeding; scalding; removal of atmospheric pressure; homœopathy; ligature of limbs; massage; percussion; application of heat, and of cold; and vaccination. Curiously enough, as it may appear to us with our present knowledge of the disease, many of these have obtained a brief notoriety, but as intravenous injection, when properly employed, is the only treatment of the algid stage that produces an immediate and uniformly good result, it alone will be dealt with in this paper.

History of Intravenous Injection.

The origin of intravenous injection may be dated from the experiment of a German sportsman, who, early in the 17th century, injected a mixture of wine and brandy into the veins of his dogs as an amusement. These animals suffered no ill-effects as the result of this procedure other than a temporary state of intoxication.

In 1656 Sir Christopher Wren injected into the veins of a dog a solution of opium in sherry wine, in the presence of Boyle, who related that after a certain stupor the animal perfectly recovered. Boyle, some time later, in-

jected the crocus antimonii into the veins of a criminal, and recommended the trial of cordials, antidotes and diuretics in this manner.

In 1636 Dr. Lower succeeded in transferring the blood of one dog into the veins of a second, by connecting a cervical artery of the former with a jugular vein of the latter, while at the same time he bled the recipient of a quantity of blood equal to its own weight.

In 1667 Mr. Denis, in France, successfully transfused small quantities of the blood of calves and lambs into the veins of five human beings; one so treated was said to have died from the operation, but as the result of the legal proceedings which followed, this charge was not proved.

A year later Dr. King injected into the veins of a Cambridge student, reported to be mentally deficient, and who volunteered for the purpose, nearly 12 ounces of calf's blood. This operation caused no ill-effects; but, though repeated three weeks later, it failed to improve the mental condition.

At this time extraordinary ideas prevailed as to the effects expected from the use of this treatment. Suggestions were made that kings might have wisdom imparted to them through their veins, and that the mutual exchange of a few ounces of blood between husband and wife would cure and prevent matrimonial jars.

In 1691 Muller found that mercury injected into the veins of animals produced points of suppuration round the metallic globules in the lungs.

Baglivi, in Italy, first pointed out the production of rigors by the injection of cold water, and the fatal effect of air being admitted into the circulation.

In 1785 Fuller proposed intravenous injection for the restoration of persons apparently drowned, and, some time afterwards, Darwin proposed the same for stricture of the œsophagus.

Early in the present century MM. Percy and Laurent reported five recoveries out of eight cases of tetanus injected by them.

In 1820 Majendie injected a quart of tepid water in a case of hydrophobia. The injection was followed by a complete state of calm, which lasted a week, and although the patient afterwards died, such relief as this could not but stimulate to further trial. It showed the safety of large injections of liquid at the temperature of the blood. Henceforth it only remained to be learned that fluids of different densities could not safely be brought in contact with the blood corpuscles.

Treatment of Cholera by Intravenous Injection proposed.

During the first recognised visitation of cholera to the British Isles, the epidemic of 1831-32, Dr. O'Shaughnessy proposed to combat the collapse stage of that disease by means of intravenous injections; his idea being that the dark blood of cholera might be decarbonised by the addition of a solution of

salt containing a large proportion of oxygen, such as chlorate of potash. He also gave the following summary as the results of his analysis of the blood in cholera cases :—

“ 1. A material diminution of the water of the blood of the cholera patient, the specific gravity of the serum ranging from 1041 to 1054.

2. A notable decrease in the quantity of soluble salts, amounting, as far as regards the serum, to a mean loss of one-third of those substances.

3. That the solid constituents of the crassamentum, including its salts, retained their normal proportions, wanting merely water to restore it to the standard state ; and

4. That the dejections were alkaline and albuminous, and contained the water and soluble salts in which the serum of the blood was deficient.”

Employment of Saline Intravenous Injections in Cholera.

Dr. Latta, of Edinburgh, influenced by the above suggestion and analysis, was the first to practice intravenous injection in the collapse stage of cholera. His object, however, was not to supply oxygen to the blood, but to replace the salines and water lost from it by the purging and vomiting. He accomplished this by the introduction into the veins of large quantities of warm water containing common salt and carbonate of soda in solution, by means of a large syringe. The details of such an important event as this are best told in the author's own words ; he says : “ As soon as I learned the result of Dr. O'Shaughnessy's analysis, I attempted to restore the blood to its natural state by injecting copiously into the larger intestines warm water, holding in solution the requisite salts, and also administered quantities from time to time by the mouth, trusting that the power of absorption might not be altogether lost, but by these means I produced in no case any permanent benefit, but, on the contrary, I thought the tormina, vomiting, and purging were much aggravated thereby, to the further reduction of the little remaining strength of the patient ; finding thus, that such, in common with all the ordinary means in use, was either useless or hurtful, I at length resolved to throw the fluid immediately into the circulation. In this, having no precedent to direct me, I proceeded with much caution. The first subject of experiment was an aged female, on whom all the usual remedies had been fully tried, without producing one good symptom ; the disease uninterrupted, holding steadily on its course. She had apparently reached the last moments of her earthly existence, and now nothing could injure her—indeed, so entirely was she reduced, that I feared I should be unable to get my apparatus ready ere she expired. Having inserted a tube into the basilic vein, cautiously—anxiously, I watched the effects ; ounce after ounce was injected, but no visible change was produced. Still persevering I thought she began to breathe less laboriously ; soon the sharpened features, and sunken

eye, and fallen jaw, pale and cold, bearing the manifest impress of death's signet, began to glow with returning animation; the pulse, which had long ceased, returned to the wrist; at first small and quick, by degrees it became more and more distinct, fuller, slower, and firmer, and in the short space of half an hour, when six pints had been injected, she expressed in a firm voice that she was free from all uneasiness, actually became jocular, and fancied all she needed was a little sleep; her extremities were warm, and every feature bore the aspect of comfort and health. This being my first case, I fancied my patient secure, and from my great need of a little repose, left her in charge of the hospital surgeon; but I had not been long gone, ere the vomiting and purging recurring soon reduced her to her former state of debility. I was not apprised of the event, and she sunk in five and a half hours after I left her. As she had previously been of a sound constitution, I have no doubt the case would have issued in complete reaction, had the remedy, which already had produced such effect, been repeated."

Out of fifteen cases of profound collapse thus treated by Dr. Latta, five recovered. Others followed in the path thus pointed out, and several were more successful than the pioneer.

In the next epidemic, that of 1848-49, the same method was employed at the London Hospital, where Dr. W. J. Little, who had practised the operation (under very unfavourable circumstances) in seven cases with one recovery in 1832, thus treated seven patients with three recoveries.

During the epidemic of 1866 Dr. L. S. Little (son of the former), at the London Hospital, injected twenty cases, six of which recovered. In four of these cases, however, the injection used was other than saline, in two blood and in two serum, all of which died, so that the number of recoveries after saline injection was six out of sixteen.

Since then this method of treatment has been employed on many occasions with varying success, but generally in a half-hearted manner, and always only after other means have failed and the patient is at death's door.

In August, 1896, I saw Dr. L. S. Little employ this procedure in an apparently hopeless case with success at the Shanghai General Hospital, and so impressed was I with the wonderful effects of the injections and the ultimate result, that I volunteered to assist him in any future cases it might be deemed necessary to inject, as such form of treatment entails unflagging attention on the part of the medical attendants. This offer was willingly accepted. During the three months, August, September and October, there were twenty-one cases of cholera admitted into the hospital, and of these eleven were treated by intravenous saline injections with seven recoveries and four deaths. Of the ten non-injected cases five recovered and five died. Taking both classes together the total mortality from cholera for the year 1896 was less than any year since the hospital was first established in 1864,

with the exception of the first year, when it might be safe to say that probably cases other than true cholera were included among the recoveries.* If the injected cases of 1896 alone be taken and contrasted with the average mortality for the thirty-three years, the figures show 59 % as average for the previous years, and 36 % for 1896—a gain of 23 %. This large gain is, I believe, entirely due to the treatment by intravenous injection.

Action of Intravenous Injections in Cholera explained.

It is now universally recognised that cholera is caused by the comma bacillus located in the intestinal tract. Its presence there occasions a hypersecretion of the *succus entericus* which is poured out in such quantities as to drain the whole body of its fluids, the blood being the first and chief-sufferer. That it is this lack of fluid in the blood which causes most, if not all, of the symptoms of the algid stage of cholera, is proved by their disappearance on injection. Indeed, similar symptoms may even occur without the presence of the bacillus, as in excessive diarrhœa, the too free use of saline purgatives, or after excessive hæmorrhage. If the poisonous product of the bacilli is responsible for any of these phenomena, it is probable that the fluid injected has a double action; thus, in addition to restoring the bulk and fluidity of the blood, it may have also have either a direct antidotal effect towards this toxin, or, by reason of renewing and maintaining the normal condition of the blood, permit of the cells secreting the antitoxin necessary to neutralise such poisonous product.

If we examine these symptoms of the collapse stage, the following may be accepted as causes arising solely from the loss of the blood plasma and local irritation by the bacilli.

Symptoms.

Causes.

1. Weak heart.	}	Diminished volume of blood in heart and vessels.
2. Feeble pulse.		
3. Shrivelled extremities.	}	Do. and stasis of inspissated blood in capillaries and small vessels.
4. Cold breath.		
5. Shrunk eyeballs.		
6. Cramps.		Do. do. and by loss of body fluids.
7. Great thirst.		Do. do. producing dryness of vocal cords.
8. Whispering voice.		Do. do. producing venous blood supply to the respiratory centre.
9. Rapid, shallow breathing.		
10. Suppression of urine.		Diminished blood pressure and amount of blood plasma; also absorption by mucous membrane of bladder.

* See Tables I and II.

*Symptoms.**Causes.*

- | | |
|-----------------------|---|
| 11. Cold sweat. | Stimulation of sympathetic by internal pyrexia. |
| 12. Internal pyrexia. | Increased activity of intestinal glands from local presence of comma bacillus; also cramps of skeletal muscles. |
| 13. Alvine flux. | } Reflex irritation from intestinal tract, produced by presence of comma bacillus and fluid accumulation. |
| 14. Vomiting. | |
| 15. Hiccough. | |

It must, however, be remembered that no single cause can act without having that action modified by others also called into play.

As the function of absorption of the intestinal tract is almost entirely held in abeyance during collapse, all fluids or drugs administered by the mouth or lower bowel remain either unabsorbed or are ejected without giving any relief during this stage. How different is it when intravenous injection is resorted to! Any one who has ever seen or practised the operation is never likely to forget the wonderful change so almost invariably following. With very few exceptions, (those with clots in heart and vessels), all the symptoms of the algid stage enumerated above vanish, with the exception of the diarrhœa; the first nine in almost as many minutes; the internal pyrexia falls to normal, and a moist, warm skin replaces the cold sweat as soon as the peripheral circulation is restored; vomiting and hiccough, if present, are immediately relieved; urine probably at once begins to be secreted and may be voided in a few hours; even the alvine flux may be diminished. Nor is this all, for as vomiting is checked by the injections, it also permits of the exhibition of remedies by the mouth, with the possibility of their being absorbed by the stomach or, failing that, of being brought in direct contact with the bacilli in the intestinal canal. From a moribund condition the patient may be brought to one of ease and comfort, and during the passage of the fluid the most delightful feeling of relief is experienced—as though life were flowing in through the tube. After the good effects of one injection have worn off, patients eagerly beg for a repetition. There is no parallel in the whole practice of medicine for the wonderful change that takes place.

But this extraordinary revival is only temporary in many cases. After from two to six hours the condition of the patient may be as bad as ever, and he, if not injected again before too late, will die. The good effects are witnessed on re-injection as often as it is resorted to, unless the patient has sunk too low or collapsed too often, when the right heart becomes filled with blood clot—a hopeless condition. When a single injection is not sufficient to tide over the period of collapse till reaction is established,

the duration of the benefit afforded by injection usually decreases with the number of times the operation has been performed.

*The Collapse Stage the most Fatal Period in Cholera :
Danger of postponing Injection.*

Of the 227 deaths from cholera, occurring since 1864, at the Shanghai General Hospital, 182 were on or before the third day; this represents 80%, during collapse, of the total number of deaths.* From this it is evident that this stage is by far the most dangerous period of the disease.

In 1896 the first ten injected cases were treated in the usual way; when a patient was so far gone that his case seemed hopeless, injection was resorted to, the quantity injected being regulated by the improvement produced. He was then watched, and if he sank to or near his former state, the injection was repeated as often as necessary.

That this plan is of great benefit is proved by the result, but it also has certain disadvantages; thus, the waiting for signs of improvement while other means are being tried, and postponing the injection till the pulse is absent, or nearly so, at the wrist, may result in the clotting of the inspissated blood in the heart and vessels from the stasis caused by peripheral failure. This condition was, I believe, present in three of the four fatal cases.† In the last it was very marked, the bed-card jottings of which I here reproduce:—

A. B., aged 39, French, admitted Sept. 14-15 (midnight). Died Sept. 15-16 (midnight). Taken ill after supper with vomiting, purging, and cramps; voice a whisper.

4 a.m. Collapse.

5 a.m. Pulse imperceptible. Left basilic found with difficulty. 50 ozs. injected.

9.30 a.m. Collapsed; pulseless; respiration hurried; injected 65 ozs. with obstructed slowness into right median-basilic.

12.15. Collapsed. Internal saphenous vein opened in both legs above the inner malleoli; 15 ozs. only was received into each. Large vein in fore-arm (posterior ulnar) opened, which only took up 20 ozs.; making injection 50 ozs. in all. Faint pulse came back. Was almost dead. Felt nothing of operations in three places.

3.30 p.m. Collapsed as before. Surface veins invisible. Cut down on and opened right basilic high up. Injected 160 ozs.

7 p.m. Very much better; would get up to stool; in good spirits.

9 p.m. Doing fairly well.

12 p.m. Collapsed suddenly about 11 p.m. Had passed enormous quantities of fluid into bed. Became very blue, almost black. Respiration very laboured, comatose. While preparing to inject left basilic vein death occurred.

* See Table VII.

† See Table VIII; cases 3, 4 and 10.

Though there was no *post mortem* I feel sure there was clotting of the blood in the heart and vessels in this case. The smallness of the quantities admitted at the noon injections strongly supports this conclusion; later, where a vein deeper and nearer the heart was taken, the fluid flowed much better, but the sudden attack, which culminated in death, was, I think, due to embolism of one of the pulmonary arteries, from a clot dislodged from the right ventricle. The surface veins in this case were almost empty and, as a consequence, wonderfully small and difficult to find; as the pulse was absent, the proximal ligature of the limb was of no assistance alone, but the further application of a bandage from the extremity to the point of operation helped to make them discernible.

There were six operations in all, making a total of 16 pints of saline fluid injected. No pain was experienced by the patient during any of the operations, as he was in a semi-comatose state during their performance.

Continuous Intravenous Injection employed successfully to abort Collapse.

It was through this case that I was led to the thought *that not only should injection be practised early but it should also be employed continuously for a period calculated to outlast the collapse stage.* I recognised in intravenous injection a means of counteracting the collapse, and that as long as the fluid was flowing collapse was impossible, the injected fluid taking the place of that drained by the intestines, thereby maintaining the normal volume of blood.

Dr. Little, approving of this idea, kindly promised me the treatment by this method of the next serious case; but on its admission I was not at hand and, as the case did not permit of even a short delay, he injected in his usual way and had finished before my arrival, when he handed over charge to me. As this was the last case injected, (though there were three others admitted later, none of them exhibited marked collapse), and, therefore, the only one in which I had an opportunity of testing the continuous intravenous injection, I give the notes in full as they were written down at the time:—

Herbert Whitefare, aged 22, British, stoker, S. S. *Eldrichdale*, admitted September 29th, 11 a.m. Two days before admission had eaten some Chinese food in a native restaurant, including some fish which “smelt horribly” after which he had diarrhoea which continued till admission. Next day, (that previous to admission), he dived twice from the fore-castle of the steamer into the water, a distance of about 45 feet, and swam about for an hour; after this he felt ill, which he attributed to striking the water with the back of his head at the first dive. Had bells ringing in his ears as if he got a heavy blow on each. On arrival at the hospital at 11 a.m. he lay down on the ground “doubled up with a lump in his stomach.” He was admitted at once and seen by Dr. Little, who made the following notes:—

11 a.m. Voice, a whisper; tongue, ice cold; *facies*, very marked choleraic; pulse, fair, weak, 100; legs, very cold; cramps in legs, very severe; began at 7 a.m.; cannot remain quiet; respiration, faint to occasional sighs; fingers shrivelled; temperature, axilla below 93°, rectum 98.4°.

11.30 a.m. Injected 70 ozs.; feels much better and cramps gone.

As Dr. Little was good enough to send for me I arrived at 12.30, took over charge and made the following notes:—

12.30 p.m. Saw patient, after injection by Dr. Little, with good reaction.

1.20 p.m. Condition still good, but vomiting tinged with blood (?) very frequent, and stools about every ten minutes, with occasional cramps, pulse weak, but fairly perceptible.

2 p.m. Opened left median basilic and introduced glass nozzle, capable of supplying 1 oz. a minute at a height of 2½ feet, put splint at back of elbow and fastened nozzle in position with adhesive plaster. 120 ozs. flowed in during the first two hours; afterwards the fluid ran slower; from 4 to 5:30 p.m. only 40 ozs. passed, and by 6 p.m. 10 ozs. more, making a total of 12 pints in all. From the time that the continuous injection was started the patient had no vomiting; his motions, of which he only had one during the first two hours but more frequently later, were passed into the bed as it was necessary to keep him lying down; the only cramps he had were slight ones, shortly after the beginning of the injection, affecting the muscles of the great toe of each foot, possibly due to exposure as they disappeared on covering the feet. Before the second injection he had well marked cold perspiration, which continued for the first twenty minutes and then ceased, the skin becoming and remaining naturally warm and moist. At 5.30 he said he could pass urine if allowed to sit up.

6 p.m. Allowed to sit on stool while bed is being made; passed copious rice-water discharge; commode bucket now half full (6 to 8 pts.); passed urine freely at stool; bed soaked through with alvine discharge; said he "would like slippers to walk about." During change of bed the vessel with saline fluid was held too low, and as the flow had stopped the cannula was removed and found to be full of clotted blood. Decided not to renew injection then.

7.30 p.m. Left patient well all round.

8.30 p.m. Pulse 100, full; respiration easy, 22; voice, which has been improving all along, is now a good chest one; feels "first-rate" and thinks he will be able to sleep. Has had two motions since 7.30; urine again with the first. Further injection considered unnecessary, but left orders to be sent for in case he had cramps, or vomiting, or became blue or restless.

30th, 9 a.m. Pulse 84, strong; respiration, normal; slept well; says he is as well as I am; feels very hungry. To get rice water *ad lib.*

4.15 p.m. Condition unchanged ; to get milk and water.

8 p.m. Condition unchanged ; feels very hungry and begs for food ; sleeps in snatches. Temperature in axilla 97.4° , in mouth 97.8° , in rectum 98.4° . Has been six or eight times to stool to-day, discharge coloured with bile.

Oct. 1st, 9.30 a.m. Slept well during the night ; had several motions, about three pints, of bile-stained fluid in which comma bacilli were plentifully found (Dr. Macleod). Is very hungry. To have beef juice. From this date there was uninterrupted convalescence, and ten days later he was transferred to the general wards, where he gained twelve pounds in weight during the first week. For a day or two he was occasionally troubled with slight hiccough, but a few drops of spirits of camphor on sugar, (which had the effect of making him vomit), always relieved him. This was the only medical treatment he received.

Though the case above narrated cannot strictly be called one of continuous injection, seeing that there were two injections with an interval of over two hours between them, yet it shows in a marked manner the advantage of the method—that of keeping the blood to or near its normal bulk. The first injection accomplished this for the time being, thereby giving relief of the distressing symptoms, but as the drain on the blood fluid still continued for the succeeding two hours without a compensatory augmentation by injection the former symptoms of collapse gradually came back, and had not re-injection been resorted to, the patient would, in all probability, have been in as sad a plight as before. Why, when the 120 ozs. had flowed in during the first two hours, only 50 ozs. should have passed during the second two hours, I can only explain by the supposition that the blood vessels became filled with the 120 ozs. and so raised the blood-pressure in them to or near the pressure of the column of water in the injection tube, and the slower flow afterwards was controlled and represented by the leakage from the veins to the intestines. Though this explanation would place the venous blood-pressure very high, and I did not notice any abnormal fullness of the veins, yet the incident that the blood from the vein found its way along the tube nearly as far as the reservoir while I thought I was holding it well above the level of the nozzle, and the fact that all injections flow slower towards the end than at the beginning, would seem to support this view. The patient suffered no inconvenience during this long injection other than that caused by the presence of the straight splint on his extended arm, from which he asked to be relieved.

The Operation of Continuous Intravenous Injection described.

I will now describe the operation of continuous intravenous injection, as employed in the above case, it being a modification of Dr. Little's method.

Apparatus :—

1. A graduated glass irrigator with three feet of small rubber tubing and glass nozzle capable of supplying 1 oz. a minute under pressure of $2\frac{1}{2}$ feet of water column, and covering lid.
2. Thermometer.
3. Scalpel, sharp pointed.
4. Dissecting forceps.
5. Probe.
6. Splint with padding.
7. Rubber adhesive plaster.
8. 1 doz. quarts distilled water.
9. 12 oz. bottle concentrated saline solution.
10. Bucket with hot water supply.
11. Dressing for wound..

The concentrated solution of salts is based (Dr. Little) on those contained in normal blood, and is prepared in a concentrated form for convenience. The formula is as follows:—

Chloride of sodium	...	...	...	...	60 grains.
Bicarbonate of sodium	...	...	...	...	20 "
Phosphate of sodium	...	...	...	...	3 "
Chloride of potassium	...	...	...	...	6 "

It should be freshly prepared, boiled, filtered and placed in a graduated 12 oz. bottle. The addition of an ounce of this solution to nineteen ounces of distilled water makes a suitable injection fluid. But common table salt of the above strength alone may be used prepared in the same way.

Distilled water should, if possible, be used in the injection, but carefully boiled and filtered water may be employed. The *silent*, thrice distilled, water of the Aquarius Company, that used at the Shanghai General Hospital, is quite reliable; the so-called quart contains about an imperial pint.

The preparation of the injection may be thus accomplished:—The corks are drawn from three of the "quart" bottles, and an ounce of the contents of each poured into a measuring glass, where its purity can be judged, and then discarded. An ounce of the concentrated solution is then added to each of the three bottles; two of these are then placed in the bucket half-full of warm water, not too hot lest the glass breaks, and hotter water is gradually added till a thermometer inserted into the bottles shows a temperature of 106°F . One bottle is then taken out, dried on the outside with a towel, and its contents poured into the reservoir of the irrigator, where a couple of degrees will be lost in warming the glass. A small quantity of the fluid is then allowed to run through the tube and nozzle to clear them of air and warm them. If the lid, with the thermometer projecting through it, be placed in position and the reservoir suspended from the cross-bar of the bed, or other suitable object at a height of $2\frac{1}{2}$ feet from the patient's arm, the apparatus will be ready for use. The fluid, in its passage from the reservoir to the nozzle, loses two or

three degrees of heat, so that it enters the vein at about 100° F. or a little higher, a couple of degrees one way or the other being of little consequence. The supply of fluid and heat is maintained by the addition of warmer solution from the second bottle in the warming bucket, and if during the performance of this the temperature is raised too high at any time, it may be reduced by the addition of cold solution from the third bottle. In adding fluid while the injection is running, it is safer to compress the tube lest a bubble of air be carried into the circulation.

Operation.—The patient is placed on his back in bed. A prominent vein is looked for, at the bend of the elbow for choice, where either the median-cephalic or median-basilic may be selected. The long saphenous just above the inner malleolus is also a suitable site. The part is then washed and a bandage applied round the limb above, as in the operation for venesection, tight enough to impede the venous but not the arterial supply. If the pulse is not altogether gone at the wrist, this will make the vein more prominent. With the scalpel an incision, half an inch long, is made through the skin, over and in the course of the vein. A little dissection is now necessary to clean the vein and permit of the probe being passed beneath. When this is accomplished, the injection apparatus being ready, the anterior wall of the exposed vein is opened by puncturing it with the sharp pointed scalpel (or better, a Symes' abscess knife) and cutting to the extent of about two lines. The ligature is then removed from the arm and, as the dark blood flows, the tapering nozzle of the injection apparatus, with the solution running, is inserted into the opening till it completely fills it. If the fluid is flowing, as shown by a fall in the reservoir, a padded splint is applied to the back of the arm and fastened above and below with two strips of rubber adhesive plaster, while a third strip is brought from the middle of the splint round the arm and glass nozzle, so as to fix the latter; this is best done by dividing up the free end of the plaster into three strips and then bringing one under and two over the nozzle. When the nozzle is securely placed and the injection satisfactorily flowing, the probe may be gently removed. The nozzle should be held perpendicular to the surface of the part in passing its tip into the vein, to avoid the possibility of passing it into the sheath or between the coats of the vein, and then directed upward along the course of the vessel. After removal of the tube the wound is dusted with iodoform and a pad and figure of 8 bandage applied.

The apparatus thus arranged can be used for hours with very little discomfort to the patient—in my case it was four hours—and its employment should be continued as long as the flow lasts, or till it is believed all danger from collapse is passed. Should the injection not have been continued long enough, as shown by a return of pulse failure and other collapse symptoms, the operation should be repeated in a new place.

Continuous Injection advocated as Free from Danger and of Lasting Benefit.

Whether it were known that, as I mentioned before, the addition of saline fluid to the choleraic blood simply makes it normal in fluidity and bulk, thereby allowing the circulatory, respiratory, digestive, and nervous systems to work smoothly, or, in addition to its loss of water and salts, this blood contains a toxin which the saline fluid directly neutralises, or permits of the leucocytes and tissue cells developing the necessary antitoxin to counteract this poison, is immaterial as far as the treatment is concerned. The fact remains that the introduction of normal saline solution into the veins at a moderate temperature and pressure is never followed by any evil effect; the argument that the relief obtainable is only temporary being the cause of its comparatively small employment, but with the continuous method here advocated, this argument can no longer be used. It may, therefore, be said that continuous intravenous injections practised as above described, is a harmless procedure, if employed early is certain to relieve the agonising symptoms of the algid stage, and, I believe, altogether prevent the continuance of this stage, in which three-fourths of the deaths occur. I would go further, though I do not feel on such safe ground, and express the opinion that this treatment also effects the reaction. That the amount of reaction depends on the degree and length of the previous collapse; by arresting the collapse the reaction is also modified. With the exception of the case injected by the continuous method which supports this view, no proof can be obtained by comparing the reaction in injected cases as heretofore practised with others not so treated, seeing that the injected cases are allowed to become very collapsed to begin with, which state may recur again and again, and the majority of such would not live to show reaction were it not for the injections.

If this plan of treatment was universally employed from an early period of the disease, I think it possible that the mortality of cholera would be reduced from fifty to fifteen in every hundred cases of this disease.

Continuous Saline Injections into the Intercellular Tissue, Peritoneum or Pluræ, suggested.

Continuous saline injection might also be employed into the intercellular tissue, the peritoneum, or the pluræ, with the same apparatus slightly modified, a hypodermic needle, or Southey's cannula being substituted for the glass nozzle; but in marked collapse a primary intravenous injection should first be practiced, at any rate in the case of intercellular injection, to restore the peripheral circulation, thereby permitting the more ready absorption of the fluid introduced and to give immediate relief from the distressing symptoms; the object aimed at being the same as in the continuous intravenous injection—that of keeping the blood at its normal volume. Were such a measure successful it would simplify the treatment and entail much less watchfulness on the part of the attendant.

Irrigation of the large intestine might also be employed in addition, with an O'Beirne's long tube and an anal speculum, the tube being passed, with the fluid flowing, as far as possible and the lower bowel thus washed out.

The following tables (with the exception of the last) have been compiled from the Register of the Shanghai General Hospital, and embrace the period from its first establishment in 1864 to the end of 1896. The following explanatory remarks may be of interest.

Cholera at Shanghai is more or less endemic, making an annual appearance generally towards the end of the summer.

Though the majority of foreigners attacked are seamen, the disease is nearly always acquired some days after arrival, and principally by those who have been on shore celebrating the end of a voyage in the usual sailor-like fashion.

The comparative immunity experienced by the foreign residents must be attributed to the hygienic precautions employed by this class with the better water, food, and houses used. It should be remembered that the cases here given do not represent the total number of foreigners attacked, there being no compulsory entrance to hospital enforced at Shanghai. Probably an additional number equal to about one-fourth of that here given have been treated outside the hospital.

Table I.

Showing the number of cases of cholera admitted during each year of outbreak from 1864 to 1895, inclusive, with the average mortality for that period.

YEAR.	NO. OF CASES.	RECOVERED.	DIED.	MORTALITY.
1864	16	11	5	31. per cent
1865	18	8	10	55.5 "
1866	1	...	1	100. "
1867	12	4	8	67. "
1875	15	6	9	60. "
1877	18	8	10	55.5 "
1878	17	7	10	59. "
1879	1	...	1	100. "
1880	2	...	2	100. "
1881	26	14	12	46. "
1882	25	13	12	48. "
1883	28	8	20	71. "
1884	1	...	1	100. "
1885	39	16	23	59. "
1886	25	8	17	68. "
1887	26	8	18	69. "
1888	7	1	6	86. "
1889	2	1	1	50. "
1890	26	9	17	65. "
1891	39	18	21	54. "
1893	1	1	...	...
1895	24	10	14	58. "
Total....	369	151	218	59. per cent

From this table it will be seen that for some years there were no cases admitted, including one period of seven consecutive years. This, however, does not exclude the possibility of the disease occurring among the Chinese during this time, of which no record is obtainable.

The average mortality—59 per cent.—is high, which may be accounted for by the practice of the late physician of the hospital, Dr. Little, of only entering well marked cases as cholera during the 28 years he officiated, while under the headings of “cholérine,” “choleraic diarrhœa” and “cholera phobia” he placed some cases which another might include under the graver heading. His predecessor followed this latter course, judging from the absence of the milder designations in the hospital register and the fact that no less than five out of the eleven cases of recovery in 1864 were discharged cured on or before the fifth day, which explains the exceptionally low mortality of 31 per cent. for the first year; were these five excluded the mortality would become 45 per cent. which would still be lower than any year prior to 1896.

Table II.

Showing the number of cases of cholera admitted during 1896 with the mortality of those treated by injection and those by ordinary means.

	NO. OF CASES.	RECOVERED.	DIED.	MORTALITY.
Injected	11	7	4	36 %
Non-injected	10	5	5	50 „
Total 1896.....	21	12	9	43 %

This table hardly does justice to the saline injection treatment, for the two classes of cases were not of equal gravity, the more severe ones being chosen for injection while the others were expected to recover without its aid. Treatment by injection, however, was only begun with the fifth case, after three deaths had occurred in the first four.

Table III.

Showing the mortality of nationalities of which more than ten cases were admitted.

NATIONALITY.	NO. OF CASES.	RECOVERED.	DIED.	MORTALITY.
Irish	31	7	24	77 %
Japanese	16	4	12	70 „
American	30	10	20	66 „
Scotch	24	9	15	62 „
Norwegian	23	10	13	56 „
English	123	57	66	54 „
Manilamen	12	6	6	50 „
Swedes	19	11	8	42 „
German	24	15	9	37 „
French	48	33	15	31 „

In this table the Irish head the list of nations with the greatest mortality from this disease, while the French and German each exhibit a mortality of less than half that of the Irish. This may, to a certain extent, be explained by the partiality Irishmen show for intoxication when at liberty and with money in their pockets. The French and German patients were mostly admitted from men-of-war in harbour.

Table IV.

Showing the advent and duration of each outbreak according to the cases admitted, and the totals for each month.

YEAR.	MAY.	JUNE.	JULY.	AUGUST.	SEPT.	OCT.	NOV.	TOTAL.
1864	...	4	9	3	...	...	...	16
1865	7	11	...	...	18
1866	1	...	...	...	...	1
1867	2	6	3	1	...	12
1875	7	8	15
1877	13	5	...	18
1878	3	5	6	3	17
1879	1	...	...	...	1
1880	2	...	...	2
1881	1	13	10	2	26
1882	2	20	3	...	25
1883	1	1	12	5	7	2	...	28
1884	1	1
1885	9	14	15	1	39
1886	1	...	...	3	15	5	1	25
1887	6	14	6	...	26
1888	6	1	...	...	7
1889	2	...	...	...	...	2
1890	18	8	...	...	26
1891	4	24	6	4	1	39
1893	1	...	...	...	...	1
1895	15	8	1	...	24
1896	6	12	3	...	21
Total. ...	2	5	31	115	152	68	17	390

This table shows the three months, August, September and October, as the time of greatest prevalence of cholera. Cases, however, have been admitted as early as May, and none later than November.

Table V.

Showing the mortality of different stages of the outbreaks, based on the number (when sufficient) of cases admitted each year.

YEAR.	NO. OF CASES.	1ST QUARTER.		2ND QUARTER.		3RD QUARTER.		4TH QUARTER.	
		RECOVERED.	DIED.	RECOVERED.	DIED.	RECOVERED.	DIED.	RECOVERED.	DIED.
1864	16	2	2	4	..	3	1	2	2
1865	18	1	4	2	2	..	4	5	..
1867	12	2	1	..	3	..	3	2	..
1875	15	1	3	..	4	..	..	2	2
1877	18	2	3	3	1	2	2	1	4
1878	17	2	2	1	3	3	2	1	3
1881	26	2	5	5	1	3	3	4	3
1882	25	3	3	4	2	3	4	3	3
1883	28	1	6	2	5	3	4	2	5
1885	39	6	4	4	6	4	5	2	8
1886	25	1	5	1	5	3	4	3	3
1887	26	3	4	2	4	1	5	2	5
1888	7	..	2	1	1	..	1	..	2
1890	26	3	4	1	5	3	3	2	5
1891	39	6	4	6	4	4	5	2	8
1895	24	4	2	1	5	2	4	3	3
Total.....	361	39	54	37	51	37	50	36	57
Mortality.		58 %		58 %.		57.5 %.		61 %.	

This table shows that cholera at Shanghai does not follow the epidemic rule of this disease, viz., that the severity diminishes with the duration, in other words, that more fatal cases occur at the beginning than at the end of an epidemic. The cholera bacillus is probably always present at Shanghai and only requires favourable conditions for its spread. The Chinese habit of cooking everything they swallow (including water in the form of tea) except fruits, accounts both for the limited extent of the annual outbreaks and the time of year they occur.

Table VI.

Showing the number of cases admitted from each decennial age period, with the mortality for each.

AGE.	NO. OF CASES.	RECOVERED.	DIED.	MORTALITY.
1 to 10	4	1	3	75 %
11 „ 20	26	11	15	58 „
21 „ 30	184	87	97	47 „
31 „ 40	105	42	63	60 „
41 „ 50	53	14	39	74 „
51 „ 60	15	8	7	47 „
61 „ 70	3	..	3	100 „
Total.....	390	163	227	59 %

Here it is seen that the majority of those attacked were in the prime of life and the mortality was greatest at the extremes of age.

Table VII.

Showing the periods on which death occurred in fatal cases, with the number for each day of the disease.

DAY OF DISEASE.	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	14th.	21st.	27th.
No. of Deaths.	93	65	24	13	8	7	2	4	4	1	4	1	1

This table shows that 80 per cent. of the total mortality died on or before the third day, *i.e.*, during collapse.

For Table VIII see next page.



Case.	Age.	Condition before Injection.	Injections.			Condition after Injection.	Result.	Remarks.
			Time.	Number.	Quantity.			
1	30	Marked collapse	1st day 10 a.m.	1st	35 ozs.	All symptoms relieved each time	Recovery	Considered hopeless by all. Protracted "typhoid" condition."
		"	" noon.	2nd	35 "			[tinaform rash.
		Moribund	" 4 p.m.	3rd	80 "			Ulcer of cornea and scarla-
2	30	Cramps most marked	" 4 "	1st	45 "	No cramps	"	Uninterrupted convalescence.
3	20	Quite pulseless; almost voiceless; vomiting; purging, very restless; cramps in legs	" 5 p.m.	"	40 "	Pulse returned and all other symptoms relieved after each	Death	Appeared to be dying before each injection; was very blue and restless throughout.
		"	2nd day 5 a.m.	2nd	40 "			
		"	" 4 p.m.	3rd	80 "			
4	28	Extreme collapse	1st day 5 "	1st	45 "	Improvement after first well marked	"	The second injection was too long delayed; the flow stopped at 40 ozs.
		No radial pulse	2nd day 7 a.m.	2nd	40 "			Uninterrupted convalescence.
5	21	Profound collapse; impossible to keep him in bed ..	1st day 4 p.m.	1st	75 "	Wonderfully improved; sleeps all the time	Recovery	
6	39	Flickering pulse	" 8 a.m.	1st	40 "	Pulse good; cramps and vomiting gone; no bad symptom	Death	After 24 hours bilious vomiting set in and continued to the end. On the 5th day became delirious and died on the 6th.
		Severe cramps; vomiting most marked	" noon.	2nd	80 "			Rapid convalescence.
7	28	Collapsed; pulseless; vomiting	" 10 a.m.	1st	70 "	Pulse and voice returned; no vomiting	Recovery	Four hours after last injection was quite comfortable.
8	29	Severe cramps; very feeble pulse; voice a faint whisper; very collapsed before last injection	" 10 "	1st	35 "	Marked improvement after each; urinated 8 hours after last	"	Rapid convalescence.
		"	" 1 p.m.	2nd	65 "			
		"	" 4:30 "	3rd	80 "			
9	22	Limbs cold; cramps very severe; pulse scarcely perceptible	" 10 a.m.	1st	40 "	Great improvement after each; urinated 6 hours after last	"	Protracted convalescence with ulcer of one cornea.
		"	2nd day 10:30 "	2nd	40 "			
10	39	Pulseless; vomiting; cramps; purging; laboured respiration	1st day 5 a.m.	1st	50 "	Injection obstructed in all but last, when improvement was very marked....	Death	History of case already given.
		"	" 9:30 "	2nd	65 "			
		"	" 12:15 p.m.	3rd	15 "			
		"	" 12:15 "	4th	15 "			
		"	" 12:15 "	5th	20 "			
		"	" 3:30 "	6th	160 "			
		"	" 11:30 a.m.	1st	70 "	During the second injection all the symptoms disappeared, and there was no recurrence	Recovery	History of case already given.
11	22	Whispering voice; ice-cold tongue; cramps in legs; vomiting, sighing respiration	" 2:16 p.m.	2nd	170 "			

Selected Article.

REMARKS ON THE CLINICAL VALUE OF EHRlich's METHODS OF EXAMINATION OF THE BLOOD.

By WILLIAM SYDNEY THAYER, M.D.,
*Resident Physician to the Johns Hopkins
Hospital, Baltimore.*
(Concluded.)

In considering now briefly the main diagnostic points which may be obtained from a morphological examination of the elements of the blood, let us first take up the so-called diseases of the blood itself.

Ehrlich, in his address last April before the Eleventh Congress for Internal Medicine, says: "With diseases of the blood, in contrast to most other affections, we find ourselves in a favorable position in that we are able to obtain during life, and not for the first time post-mortem, satisfactory information concerning the nature of the changes taking place." Here, perhaps, the examination of the blood is of the most positive advantage, but as I shall try to show later, there are many other conditions where it may be of considerable help.

First, then, let us consider schematically the characteristics of the various types of anæmias, noting how much may be determined from an examination of the dried specimens alone.

Before taking up the essential anæmias it may be well to consider the general features common to most secondary anæmias.

Secondary Anæmias.

Oligocythæmia.

Oligochromæmia. (The relative loss in hæmoglobin being considerably greater than in corpuscles.)

Variations in size of the red elements with perhaps slight average diminution in diameter.

Poikilocytosis.

Pallor of the individual elements, that is, the point of greatest biconcavity more marked than normally.

Degenerative forms.

Nucleated red corpuscles (normoblasts).

Leucocytes. There is a leucocytosis in acute cases. In old chronic secondary anæmias the leucocytes may be about normal or even sub-normal in number, and in these cases where the course is much less favorable, nucleated red corpuscles are not nearly as numerous, and an occasional megaloblast may be seen. The following case is a good example of a secondary anæmia.

D. Grave Secondary Anæmia following repeated Venesections (practised by the patient herself).

Red corpuscles	-	1,775,000
Colorless corpuscles	-	10,500
Hæmoglobin	-	19%

Specimens of blood stained with the triple stain showed: considered difference in the size of the corpuscles; moderate poikilocytosis. Three typical normoblasts seen while making a differential count of over one thousand leucocytes. Differential count:

Small mononuclear	-	10+ %
Large mononuclear	-	1.5 %
Transitional forms	-	1.1 %
Multinuclear neutrophils	-	85+ %
Eosinophiles	-	2.1 %

It is easy to see that many of the most important points are to be obtained here from the examination of a dried specimen; only the actual count of the elements is lost.

Primary Pernicious Anæmia.

Oligocythæmia (more marked than in any other known condition).

Oligochromæmia, which is absolute but not relative: the relative proportion of hæmoglobin being higher than the number of corpuscles (a most characteristic point).

Great variation in the size of the elements with probably an average increase in size.

Poikilocytosis (marked).

Degenerative forms.

Nucleated red corpuscles in varying numbers, a most characteristic point being the presence of a distinct proportion of megaloblasts which, when present in a considerable proportion are almost diagnostic. Megaloblasts are to be found, as has been said above, in other "essential blood diseases," and sometimes in grave secondary anæmias. As Ehrlich has pointed out, an occasional megaloblast with a considerable number of normoblasts is a point of relatively little significance, while the presence of a small number of nucleated red corpuscles consisting largely of megaloblasts would be a grave sign. Nowhere does one see so large a proportion of megaloblasts as in pernicious anæmia, and nowhere are such typical large forms found.

Leucocytes: usually diminished in number, showing a relative increase in the small mononuclear elements (lymphocytes, small transparent forms), while the multinuclear elements are relatively diminished, sometimes being under 50 per cent.

The number of eosinophiles varies.

The following case is an example of this: The blood was from a case of pernicious anæmia with between one and two millions of red corpuscles in the cubic millimetre and a small number of leucocytes:—

Small mononuclear	- - -	38.4 %
Large mononuclear and transition forms	- - -	3.8 %
Multinuclear neutrophiles	- - -	54.3 %
Eosinophiles	- - -	3.1 %

Here the difference between the relative proportion of red corpuscles and hæmoglobin is an important diagnostic point, but with the presence of the marked poikilocytosis and megaloblasts, and in severe cases the changes in the relative percentage of the colorless corpuscles, the diagnosis

may be made with more certainty from a dried specimen than by the blood-counter.

That there are grave and even fatal anæmias which do not fall under this heading, which show deviations from this type of blood, is undoubted. Some of the anæmias associated with an enlarged spleen ("splenic anæmia,") as well as some of the anæmias with Hodgkin's disease do not fall into this class.

The great majority, however, of the cases which have been classed clinically as progressive pernicious anæmia show this type of blood; and in this brief summary we can only mention those definite types that have been so far made out.

Chlorosis.

Oligocythæmia (variable, usually moderate). In 64 cases in which I counted the blood and estimated the hæmoglobin, the average number of red corpuscles was 4,096,544, while the average per cent. of hæmoglobin was only 43.3 per cent.

Oligochromæmia (relatively very great).

Difference in size of the corpuscles with possibly a slight average diminution in the size in severe cases.

Poikilocytosis, considerable in severe cases.

Pallor of the individual elements.

Degenerative forms.

Nucleated red corpuscles in severe cases where there is marked oligocythæmia.

Leucocytes. There is little if any increase in leucocytes. In my 64 cases the average number of leucocytes was 8,467, a very slight increase. Thus it may be seen that while the morphological characteristics of the blood in chlorosis are nearly the same as in secondary anæmia, the essential characteristic, that of the great relative diminution in hæmoglobin, cannot be entirely denied, as v. Limbeck has attempted to do.

The so-called "simple anæmias," in my experience, show generally the same characteristics as the secondary

anæmias. This class, as a matter of fact, simply includes those anæmias for which we can find no cause, and which do not fall into the definite class of primary pernicious anæmia. They are probably usually examples of chronic secondary anæmia.

Leukæmia is generally met with in two forms :—

(1) *Spleno-Myelogenous Leukæmia*. The blood shows quite distinct characteristics.

Oligocythæmia, rarely under 2,000,000.

Oligochromæmia, relatively considerable.

Difference in size of the corpuscles with possibly a slight diminution in the average size.

Poikilocytosis, marked in severe cases.

Degenerative forms.

Nucleated red corpuscles: generally more numerous than in any other condition of the blood. Both normoblasts and megaloblasts may be found—numerous large elements in the process of division are not uncommon.

Leucocytes: generally increased in number more than under any other circumstances, while in their individual characteristics and the relative proportion of the different varieties one to another they show marked deviations from the normal.

(1) There is a very small relative proportion of the small mononuclear elements.

(2) The polynuclear neutrophilic elements are numerous, but in actual proportion often diminished. Great variations in size may be noted.

(3) The large mononuclear elements are very numerous, and among these are certain elements in which the protoplasm is filled with fine neutrophilic granules. Ehrlich has termed these elements.

(4) Myelocytes. These are found (in adults) barring an occasional unimportant exception, only in this form of leukæmia; on examining the blood-forming organs they are to be found alone in the marrow (Ehrlich),

hence the name. There is also a number of large mononuclear elements with protoplasm staining deeply like lymphocytes.

(5) The eosinophilic leucocytes are present in about a normal relative proportion, that is, are absolutely greatly increased. They, too, as in the case of the polynuclear neutrophils, show the greatest variations in size.

(Of certain amphophilic and basophilic leucocytes occurring in leukæmic blood it is not worth while to speak in this brief summary. Their practical diagnostic importance is not yet great.)

The proportion of these elements in an average case of leukæmia may be shown in the following count, from a case in Professor Osler's wards at the Johns Hopkins Hospital, in which the proportion of white to red corpuscles was as one to three.

Small mononuclear leucocytes-	.96 %
Large mononuclear and transition forms - - -	3.0 %
Multinuclear neutrophiles - - -	70.0 %
Myelocytes - - -	23.5 %
Eosinophiles - - -	2.3 %

The diagnosis of this form of leukæmia depends then largely upon the histological examination of the blood. The most characteristic points are: (1) the presence of nucleated red corpuscles; (2) the relative diminution in the small mononuclear elements; (3) the great difference in size in the multinuclear elements; (4) the presence of myelocytes; and (5) the presence of a normal proportion of eosinophiles in so extensive an increase of leucocytes. The presence of a nearly normal percentage of eosinophiles I still consider a point of some value in the diagnosis of this form of leukæmia. Many authors have, I think, entirely misunderstood Ehrlich's original statements with regard to this point. He has, so far as I know, never asserted that the presence of eosinophilic cells in leukæmia was diagnostic; and he has not, as so many have assumed, asserted that

they were necessarily present in an increased relative proportion. Neither has he said that they are present in increased numbers in all forms of leukaemia. In twelve cases of typical spleno-myelogenous leukaemia, from which I have specimens of the blood, the presence of at least a normal percentage of eosinophiles has been in all a marked characteristic.

(II) *Lymphatic Leukaemia.* This form is much rarer. It is often the most acute and rapidly fatal of the so-called blood diseases. Here the oligocythæmia is often more marked than in the other forms, while the proportion of white to red elements is commonly not so great. Nucleated red corpuscles are rare, and when present are often megaloblasts. The colorless corpuscles here show a great increase in the small mononuclear elements. In a case, for the blood of I which am indebted to Dr. F. C. Shattuck, there were found:—

Small mononuclear elements (almost entirely lymphocytes) . . .	97.9 %
Large mononuclear elements . . .	0.4 %
Multinuclear neutrophiles . . .	1.4 %
Eosinophiles . . .	0.1 %

That forms of leukaemia may occur where the blood does not answer to either of these types, is true, but they are probably uncommon. In 16 cases of leukaemia from which I have specimens of the blood, 12 corresponded exactly to the first type, three to the second; while in one case, which occurred at the Johns Hopkins Hospital, where all the lymphatic glands, the spleen and the marrow were markedly affected, the proportion of white to red corpuscles being as one to twenty-five, the blood contained but six per cent. of multinuclear elements, 5.4 per cent. of myelocytes, one per cent. of eosinophiles, the large mononuclear and small mononuclear leucocytes representing the rest of the elements, 87.6 per cent.; nucleated red corpuscles were scanty. (In this case karyokinetic figures were found in the nuclei of some large mononuclear leucocytes in the blood, and in a

great number of similar elements in the bone marrow; they were present, but less numerous, in the spleen, lymphatic glands, and lymphatic tissues generally. The case will be reported later.)

Some other conditions in which the examination of the blood may be of value.

All conditions associated with any inflammatory process, if it be of any extent, are accompanied by a leucocytosis; and, as has been before said, this leucocytosis in man consists generally in an increase in the relative proportion of the polynuclear neutrophiles, the increase being at the expense of the small mononuclear elements. Such conditions are *abscess, phlegmon, erysipelatos processes, acute tonsillitis, inflammations of the serous membranes, pleurisy, peritonitis (appendicitis), meningitis.* This leucocytosis varies in extent in various conditions. It varies within certain limits, proportionally to the extent of the process. The following is an example of an excessive leucocytosis:—

K. Pneumonia, Acute Hæmorrhagic Nephritis.

Red corpuscles . . .	5,094,000
Colorless corpuscles . . .	114,750

1: 44+

Differential count of the leucocytes:

Small mononuclear	0.32%
Large mononuclear	1.12%
Transitional forms	1.12%
Multinuclear neutrophiles	97.44%

GENERAL DISEASES.

Tuberculosis.—In all forms of tuberculosis there is usually a relatively slight anæmia. The anæmia of tuberculosis is often more apparent than real. In the latest stages of pulmonary tuberculosis there may be a relatively high proportion of corpuscles and hæmoglobin, while on superficial examination there would appear to be grave anæmia. Leucocytosis is present to a greater or less extent in almost all forms of tuberculosis, particularly in chronic pulmonary tuberculosis. In acute general tuberculosis

this is probably usually the case; and several counts by Uskow show that in his cases the increase was simply in the multinuclear elements with a relative diminution in small mononuclear elements alone. One case, which I have observed was, however, a marked exception to this rule, the colorless corpuscles being present in diminished number.

Typhoid Fever.—Here the blood shows certain quite important changes. It has been shown by various authors that typhoid fever may be followed by a grave anæmia. In one case which I observed in Professor Osler's clinic at the Johns Hopkins Hospital, this amounted to 1,300,000. The colorless corpuscles on the other hand, have been shown not only to be present in a not increased number, but actually during the height of the fever to be somewhat diminished, a fact of considerable importance from a diagnostic standpoint. This point has been verified by Dr. J. S. Billings, Jr. and myself in nearly 200 counts of the blood in typhoid fever.

Furthermore, the careful analyses of the blood by Uskow and Chetagurow have shown that in patients suffering from typhoid fever (1) there is a sharp falling off in the relative number of multinuclear elements, it may be under 50 per cent.; (2) this fall begins usually in the first week, is more sharply expressed in the second or third or even fourth weeks; (3) the percentage of "over-ripe" elements begins to increase about three to twelve days after the disappearance of the fever. Chetagurow finds that it does not reach the normal until the tenth or eleventh weeks. (4) The percentage of the small mononuclear elements average only one and a half times as much as that of the large mononuclear, instead of being normally three times as great. (5) The decrease in the number of the multinuclear elements depends not so much on the parallel increase in the percentage of the small mononuclear leucocytes as on the increase in the percentage of the large mononuclear

cells. This point appears to be one of considerable importance, and on various occasions I have been able to make a probable diagnosis of typhoid fever when without the examination of the blood it would have been extremely difficult. In most of my counts in typhoid fever I have found the large mononuclear elements even more numerous than these authors.

Case : H. *Typhoid Fever*, 4th week :

Small mononuclear	- - -	18.1 %
Large mononuclear	- - -	22.4 %
Transitional forms	- - -	4.5 %
Multinuclear neutrophiles	- - -	53.1 %
Eosinophiles	- - -	1.9 %

The differential diagnosis thus between typhoid fever and tuberculosis in its various forms, or the various inflammatory conditions, and particularly pneumonia, of which we shall speak next, is made materially easier.

Pneumonia.—That a leucocytosis of considerable extent occurs in pneumonia has long been known. The researches of Uskow, Kikodse, and others have led to interesting results. Kikodse's conclusions are as follows: (1) The number of white blood corpuscles in the blood of a patient with pneumonia exceeds the normal one, two, or three times. (2) In severe cases which threaten a fatal result, there is no leucocytosis to be observed. This is therefore of great prognostic importance. (3) The number of colorless blood corpuscles increases largely through the increase in the multinuclear elements. (4) These changes in the blood appear at the beginning of the disease, and, indeed, before very important changes have developed in the lungs, remaining without marked variation until the crisis. (5) The most constant change in the number of leucocytes is observed on the day before the crisis when there is an increase in the percentage of the multinuclear elements. (6) The development of the leucocytes, as also the increase in the number of multinuclear elements in the blood, takes place *pari passu* with the increase of the temperature. (7) The morphological elements of

the blood during the fever of acute pneumonia seem to be delayed in their progress towards final destruction. (8) At the time of the crisis in the temperature there is a crisis in the number of the white blood corpuscles, which fall sharply to normal and often under normal, the percentage of multinuclear elements becoming at the same time less. (9) On the day of the crisis the colorless corpuscles show a special tendency to degeneration.

The most valuable point here shown is the fact that pneumonia is usually associated with an extensive leucocytosis, which is coincident with the fever. That in some fatal cases this leucocytosis has not been observed is of great interest, but of how much importance we cannot yet be sure.

Among other diseases which are generally associated with a leucocytosis, in which, however, no other important changes have been noticed, are *diphtheria*, *acute rheumatism*, *endocarditis*, and *small-pox*.

In *scarlet fever* Kotschetskoff found in an analysis of 20 cases, that there was a considerable anæmia coming on gradually, and there was an extensive leucocytosis: in several fatal cases, over 30,000. This leucocytosis appeared from two to three days before the eruption, and reached its maximum two or three days after its disappearance, where it remained for several days to fall gradually. The percentage of the polynuclear elements with the eosinophiles was at all times markedly increased, in some cases as high as 98 %. All the cases which he observed, with over 95 % of "over-ripe" elements, died. A leucocytosis of over 30,000 was a grave symptom. The behavior of the eosinophilic cells was particularly typical. In mild cases the number of eosinophilic cells was normal or even sub-normal in the beginning. From the second or third day it gradually increased until it reached its maximum (eight to fifteen per cent.) in the second or third week of the disease. It then gradually sank until it reached its normal point about the sixth week.

In severe cases the opposite took place, namely, the number of eosinophiles fell rapidly and disappeared perhaps in two or three days. The percentage of the small mononuclear elements fell in the first part of the disease to two or three per cent., and gradually returned to normal. The percentage of the large mononuclear elements showed nothing characteristic. These variations in percentage were so typical that the author believes that a prognosis may be based on their course.

New Growths.—In some rapidly growing tumors a considerable leucocytosis has been noticed.

In almost all neoplasms at an advanced stage there is a considerable degree of anæmia; the blood showing the changes typical of a secondary anæmia. In some cases of obscure abdominal trouble the evidences of a grave secondary anæmia may be of considerable value in differential diagnosis, particularly between tuberculosis, where the anæmia is usually slight, and carcinoma, where it is generally severe.

Parasites and Bacteria.—It is hardly within the scope of these remarks to enter particulars concerning the various organisms which may be found in the blood. Suffice it to say, that most of basic stains will demonstrate bacteria or the malarial parasite. For the malarial organism the various combinations of eosin and methylene blue give particularly good results, though the examination of fresh, unstained specimens is, I think, more satisfactory.

Returning then in conclusion to the original theme, the value of these methods of contrast staining, we may, I think, justly assert that, in the first place, the red corpuscles may be in almost all respects as satisfactorily studied as in the fresh specimen. Degenerative (?) and regenerative forms, which are difficult or impossible to demonstrate by other methods, are here easily studied.

The leucocytes we have been ena-

bled to analyze and classify in a manner heretofore impossible.

Well-prepared specimens can, as Mueller says, be subjected to every method of examination that has been applied to microtome sections. By the practising physician the blood-counter and the hæmometer are not easily carried about and applied at the bedside; a fresh specimen often spoils before one reaches the office; it is, however, easy to carry two small forceps, a few cover-glasses, and a small vial of alcohol in the pocket, and a dried specimen once made can be examined at leisure.

The classification of leucocytes may at first seem complicated, but a little study soon clears it up. That one cannot become familiar with such methods in a day or in a week is true, but few valuable clinical methods are introduced in medicine which do not require study and practice before one can appreciate them and apply them intelligently.

I believe that no one who devotes

himself for a time to acquiring proficiency in these methods of examination of the blood will fail to find them of considerable assistance in his daily work.

These particular methods have given us valuable hints as to the nature of some of the so-called diseases of the blood; they have given us the most reliable means of diagnosis in some of these processes which we now have; they have opened a large and hopeful field for observation in many other pathological processes. Here some may be disappointed to find few, if indeed any, changes in the blood pathognomic of any particular disease; but from the few examples I have cited in this short review of the subject, we may, I think, justly hope to add to our present knowledge more of these small points which, though they may not of themselves be diagnostic, form by their accumulation the symptomen-complex, as the Germans call it, of a specific disease.



Medical and Surgical Progress.

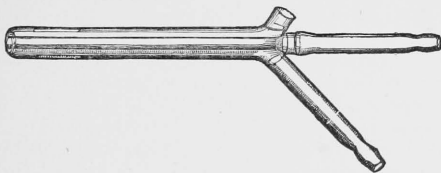
INDICATIONS FOR THE USE OF THE DOUBLE-CURRENT RECTAL IRRIGATOR, POSITION OF THE PATIENT, TEMPERATURE OF THE FLUID, SOLUTIONS EMPLOYED, ETC.

By ROBERT COLEMAN KEMP, M.D.

In the *New York Medical Journal* of March 13th, 1897.

A cut is shown in this article for the convenience of those who have not seen the instrument. The advantages of the present instrument are simplicity, cleanliness, and excellent results clinically. The irrigator is made on the principle of a tube within a tube—the central tube opening at the apex of the instrument, and there being two lateral openings in the

outer tube. In the cut the glass irrigator, with cork opening, above the oblique tube, is shown; also the hard-rubber irrigator, the upper tube. In this the cap unscrews, and also the central tube, which is to be withdrawn when the tube is cleaned. The soft-rubber rectal tubes and also the long colon tubes are made after nearly the same model. Some of the glass-tubes have no cork opening, and in these the return current should always be through the centre. The third tube shown, the longest in the cut, is the model of the soft-rubber irrigator, either stiff or flexible, and also of the colon tube. For further convenience a list is appended of the different tubes.



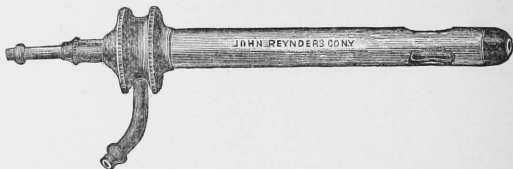
Glass Double-current Rectal Irrigators, five inches long.—No. $\frac{1}{2}$; diameter, three-eighths of an inch—the best size for general

use. No. 1; diameter, half an inch. No. 2; diameter, five-eighths of an inch.



Hard-rubber Double-current Rectal Irrigator, five inches long.—No. $\frac{1}{2}$; diameter, three-eighths of an inch—the best for general use. No. 1; diameter, half an inch,

No. 2; diameter, five-eighths of an inch. Infant size; diameter, one-fourth of an inch; four inches long.



Soft-rubber Double-current Rectal Irrigators, five inches long.—No. 1; Soft-rubber, hard-rubber centre (stiff); diameter, five-eighths of an inch. No. 2. Soft-rubber, metal centre; can be curved; diameter, five-eighths of an inch. No. 3. Soft-rubber, linen centre (flexible); diameter, five-eighths of an inch. No. 4. Infant sizes; diameter, three-eighths of an inch; four inches long; same as adult varieties.

Soft-rubber Colon Tubes (Flexible), Double-current.—Adults, soft-rubber, linen centre; diameter, five-eighths of an inch; length twelve to fourteen inches. Infant, soft-rubber, linen centre; diameter, three-eighths of an inch; length, eight inches, special lengths to order.

For general work, the number $\frac{1}{2}$, hard rubber, adult is the best, as it can be used safely on adults or infants.

The Rectal Irrigator.

Methods of Attachment.—1. The tube of the fountain syringe is attached to the curved tube, and the current enters by the lateral opening and returns directly through the central tube. A short soft-rubber tube is attached to the central tube. By alternately pinching this and the tube of the fountain syringe the quantity of fluid entering and escaping can be regulated.

2. If the fountain syringe is attached to the central tube and the carry-off tube to the lateral tube, the current seems more forcible, but method 1 is as a rule the better, except with the flexible tube.

Insertion of the Instrument.—1. The tube should be well lubricated and inserted with a gentle rotary movement, not forced in; this is especially the case with the hard tubes.

2. If the flow ceases, rotate the tube slightly, or withdraw it slightly and push it back. If the return tube seems plugged, attach the fountain syringe to it for an instant, and force the current in the opposite direction.

3. Insert the rectal tube about a third to half its length in prostatic cases, etc., and full length for high irrigation.

N. B.—*Clinically*, the rectal tube, inserted full length, and the patient with hips elevated, seems to be satisfactory, even in high irrigation, as in colitis etc., though some prefer the colon tube.

Position of Patient.—*a.* In low irrigation (prostatic cases, etc.); Patient sitting upright, or semi-oblique, or dorsal position, with shoulders higher than the hips.

B. In pelvic peritonitis, etc.; Position dorsal, or Sims's.

C. In high irrigation :

1. Dorsal position—hips elevated, shoulders at lower level.

2. Patient on right side—hips elevated, shoulders at lower level.

3. Patient on side—hips elevated, shoulders at lower level.

4. Method by rotation.

a. Patient on left side, hips elevated, descending colon irrigated freely.

b. Rotate gradually to dorsal position and then to right side, hips-elevated, return tube being pinched; about a pint and a-half being allowed to run in.

c. Shoulders then elevated to above level of hips, patient still on right side. This is to make the fluid gravitate into the caput coli.

d. Shoulders then depressed to below hip level, patient on right side, gradually

rotated to back and left side, etc. In other words, the process reversed. Return tube let go and fluid allowed to escape.

The dorsal position, hips elevated, will be found convenient as a rule. The position on the right side is also convenient.

Temperature.—Hot irrigation, 101° to 104° F., and cold irrigation, 60° to 90° F., are the average temperatures employed. The average patient prefers heat to cold by this method, and stands it better, and at about 101° F.

Solutions employed.—Solution A. Flaxseed tea. Formula; Two drachms of flaxseed to a quart of water, boiled and strained. Temperature, 101° F.

Solution B. Normal salt solution. A drachm of salt to a pint of water.

Solution C. Normal salt solution with oil of peppermint, five to fifteen minims, or oil of cinnamon, five to fifteen minims to a pint of water.

Solution D. Plain boiled water.

Solution E. Boric acid, half a drachm to one drachm to the quart; occasionally to the pint.

Solution F. Permanganate of potassium, three grains to two quarts.

Solution G. Bichloride of Mercury (1-10,000), two quarts.

Solutions A, B, C, and D have been used continuously for considerable periods of time, even to an hour. Solution E, two to four quarts, once or twice a day. Solution F, two quarts, once or twice a day. Solution G, two quarts, once a day for three successive days, as in croupous (membranous) colitis; thus reported with excellent results in cases following typhoid fever, etc.

Height of Douche Bag.—Generally about three feet above the patient is sufficient.

Quantity of Fluid.—This depends entirely upon the case in which it is employed. In colitis, etc., several ounces (4-6) should be allowed to flow in before escape is permitted. If it is deemed necessary to irrigate the caput coli, the method by

rotation and employing about a pint to a pint and a half at a time seems most satisfactory. In shock, uremia, intestinal paralysis, etc., about a pint to a pint and a half should be kept continuously in the intestines. In low irrigation, as in prostatic cases, etc., two to four ounces are sufficient to be kept in the bowel continuously. Dorsal position will be found most convenient as a rule.

This method of double-current irrigation has been reported as being successfully employed in the following classes of cases. In all these the five-inch tube was used.

Cases—1. *Simple Catarrhal Colitis*.—Solutions A, B, C or E; two quarts daily if necessary at about 101° F. Some prefer solutions B or C, two quarts, cold, at 60° to 90° F. daily, if necessary.

2. *Catarrhal Appendicitis*, in which, from history or from examination of the stool, there are evidences of colitis; solutions A, B, C, D, or E, two to four quarts once or twice a day, are recommended.

3. *Membranous (Croupous) Colitis* (such as follows typhoid fever, etc.)—Solution G, once a day, two quarts 101° F. for three days. Solutions A, B, C, D, at 101° F., can be employed once or twice a day until return is clear, or solution E or F, at 101° F., once or twice a day—two quarts.

4. *Acute Dysentery.*—Tenismus, hæmorrhage, etc., prominent symptoms. Solutions A, B, C, or D once or twice a day, at 101° F., until return is clear. Some use it also after each movement in addition. Solutions E or F, two quarts once or twice a day at 101° F., suggested, or solution G, two quarts daily, at 101° F., in severe septic cases suggested for three days and then followed by milder solutions for several days.

In cases where there is considerable hæmorrhage several quarts of very hot solution, 110° to 120° F., have been suggested, or, on the other hand, cold at 60° F. or less, care being taken to avoid shock. Irriga-

tion with two-per-cent. tannin solutions and with 1 to 1,000 quinine in amoebic cases, as previously reported by many observers, could also be employed.

5. *Chronic Dysentery*.—Solutions A, B, C, or D daily once or twice or more, two quarts or more temperature 101° F. Solutions E or F two quarts once or twice a day at 101° F.

6. *Intestinal Dyspepsia*.—The following has been suggested: Solution B or D, two quarts once or twice a day, douche at 101° F., to wash out undigested products. If much fermentation use A, C, or E.

7. *Chronic Constipation*.—Solution B or D. (1) Hot douche, 102° to 120° F., two to four quarts, once or twice a day, rectal or high irrigation. If above 104° F., and especially if high irrigation, use with caution; or (2) cold douche, same method. Temperature from 80° F. to iced water. The method is somewhat more violent. Caution should be observed; or (3) alternate douche, two, quarts each, of hot and cold, at above temperatures once or twice a day. In this the glass Y is attached, as suggested by Dr. Minor. Injection intermittent, a few ounces at a time.

8. *Intestinal Paralysis*.—Solution A, B, or D, continuous irrigation at 102° to 104° F. for a considerable period; even half an hour or more. Solution A would suggest itself as excellent to promote peristalsis. About a pint of fluid should be kept continuously in the bowel.

9. *Fæcal Impaction*.—Solution B or D, at 101° F., continuous irrigation with five inch rectal tube, especially with one of large calibre.

10. *Gastro-enteritis in Infants and Children*.—Solution B, daily once or twice until return is clear at 101° F. employed successfully. Solutions A, C, D, E, and F have been suggested. In cholera morbus, cholera infantum, or in fact any diarrhoeas where the lesions are in the small intestine, irrigation of the large intestine for

cleanliness, and to prevent self-infection is logical. Same solutions as in class 10.

11. *Typhoid Fever*.—Solution B, daily two quarts or more, at 101° F., to cleanse large intestine, relieve tympanites and prevent self-infection. Result excellent. Used when indicated.

12. *Jaundice (Duodenal)*.—Solution B or D, two to four quarts once or twice a day, at 101° F., occasionally at 104° F. Others do better at 60° to 80° F. Results excellent. Solutions C or E suggested if there is much intestinal fermentation.

13. *Shock*.—Solution B or D, (B is the better). In general the temperature of saline solution should be at 101° to 104° F. and the irrigation continued for a considerable period of time. About one to two pints should be kept continuously in the intestine. If the temperature is subnormal, irrigation at 110° to 120° F. can be employed until it rises to normal; thereafter, if necessary, employ it at 101° to 104° F. This method can be employed during an operation. The short tube gives satisfaction.

14. *Uræmia* (suppression of urine or insufficiency, with symptoms progressing in that direction).—Solution B or D, (B is the better.) Temperature 101° to 104° F. Continuous irrigation for a considerable period, as in shock, from half an hour to even an hour. As much as fifteen to twenty gallons has been employed.

15. *Hæmorrhage* (loss of blood during an operation, etc.).—Solution B, at 101° to 104° F., same method as in shock, is suggested.

16. *In Gynæcology*.—In many conditions heat or cold can be applied to the uterus and its appendages better per rectum than per vaginam, as can be seen from observation of the anatomy of the parts; also in unmarried women the advantages are self-evident.

a. *Ovarian Neuralgia*: Solution B or D, daily rectal irrigation once or twice at 101° to 104° F., two to four quarts.

Position dorsal and level, two-thirds length of tube inserted.

b. Pelvic Peritonitis: Solution A at 120° F. one hour three times daily for ten days. Position dorsal or Sim's. Solution A is the best to promote absorption. Rectal irrigation also suggested (1) during menstruation, when insufficient (by Dr. Gaudin), (2) dysmenorrhœa, (3) menorrhagia, (4) hæmorrhage, (5) inflammatory conditions of the uterus and adnexa, etc.

17. *Rectum*.—a. Congestive condition of the rectum, with ulcers following operation for hæmorrhoids. Cold irrigation forty-five minutes morning and night.

Solution B or D can be employed either cold or hot, as 60° to 80° F., or even iced water; or 102° to 120° F., morning and night, depending on the patient, and from ten to forty-five minutes; four ounces to the pint, kept in rectum continuously, depending on the case; or solution E or F, two to four quarts morning and night, hot or cold, as above, if much disinfection is necessary.

b. Proctatitis, ulcers, fissures, etc., (four ounces to half a pint, kept in bowel continuously). Solution A, B, C, or D, two to four quarts, once or twice a day at 101° to 104° F., suggested. Solution E or F, two quarts daily at 101° to 104° F. Solution G, suggested every few days, two quarts at 101° F. in syphilitic ulcers; milder solutions during interim.

c. Internal hæmorrhoids (four ounces to half a pint, kept in bowel continuously): Solution B or D two to four quarts or more at 102° to 104° F., or even to 120° F., once or twice a day; or cold, 60° to 80° F., or even iced water.

18. *Genito-urinary*.—In most of these cases a few ounces (from two to six), kept in the bowel continually, are sufficient.

a. Prostate: (1) congestion, (2) acute inflammation, (3) chronic enlargement, (4) prostaticorrhœa. Solution B or D, two quarts or more from fifteen minutes to an hour's irrigation.

b. Seminal Vesicles—inflammation: Solution A suggested, two to six quarts once or twice a day, even to half an hour at 102° to 120° F., to aid absorption, or solution B or D suggested.

c. Bladder: (1) acute cystitis, (2) chronic cystitis, (3) tuberculous cystitis, (4) nocturnal irritability, (5) incontinence of urine, (6) retention of urine.

(1) Acute cystitis: Solution A, temperature 104° to 120° F., once or more a day, from five to forty-five minutes, suggested. Higher degree of heat seems the best. Solution B or D the same. Chronic cystitis, tubercular cystitis, nocturnal irritability; same irrigation, A, B, or D, hot as above, to relieve bladder irritability. (5) Incontinence of urine; Solution A, temperature 104° to 120° F., once a day or oftener, five to forty minutes, suggested, or solution B or D. 1. Hot,—104° to 120° F., five to forty minutes once or more a day. 2. Cold,—iced water to 80° F., fifteen to twenty minutes, once or more a day. 3. Alternate douche (hot or cold) Y attachment, two to six quarts, once or twice a day.

19. *Penis*.—Diminution or loss of erectile power. Solution B or D. 1. Hot,—104° to 120° F., five to thirty minutes once or twice a day. 2. Cold,—iced water to 80° F., the same. 3. Alternate hot and cold douche, two to six quarts each, once or twice a day.

20. *Nervous Conditions*.—(1) Some cases of melancholia, etc., are judged to be due in part to absorption of poisons from undigested food, etc. Solution B or D, daily irrigation at 101° F., once or twice. Two quarts or more to prevent self-infection. Solution C or E, the same if there is much fermentation. Two quarts once or twice a day. (2) The possibility of influencing the circulation, secretions, and nervous system through the abdominal plexuses, Solution B or D. 1. Hot douche—101° to 120° F. 2. Cold douche—90° to iced water. 3. Alternate douches (hot and cold) are worthy of experiment.

When the rectum is irritable I generally inject half an ounce of salt solution, and in it an eighth to a quarter of a grain of cocaine, before inserting the rectal tube.

Solution B is physiologically superior to solution D.

In many of the cases cited irrigation is only a palliative or an adjunct to other methods. Like any other therapeutic agent, it will be a success in some cases, a failure in others. The advantages alleged for the tube are simplicity and cleanliness. The caput coli and colon are a "sink for refuse," so to speak, and in diarrhoeas of the small intestine there would certainly be a tendency to accumulations below and more or less septic absorption. The good results obtained by intestinal irrigation seem to be the clearing out of such products. Cleanliness of the large intestine may often prevent or mitigate many complications.

E. H. H.

TYPHOID FEVER.

If one were to judge from the great number of papers and journal articles written upon this subject within the last few months, one might be led to think that we are about to reach some very definite conclusions in regard to the etiology, diagnosis, and treatment of this hitherto intractable disease.

Bracken, (*N. Y. Medical Journal*, April 24th, 1897) gives an analysis of forty-seven cases in which Widal's serum test was used. Sixty-seven examinations in all were made, ranging from the second day of the disease to the one hundred and second. Forty-seven tests were made in twenty-nine cases clinically diagnosed as typhoid. In these the reaction was found present thirty-eight times and absent nine. In only four cases among these was the reaction not found at all, and in each of these only one test was made. Of these four cases, in three the day of the disease was not known, while in one the test was made on the tenth day. In two there had been "poor technique in

collecting the blood serum," and another was regarded to be "a typhoid without [rise of] temperature." So that in the remaining twenty-four cases clinically diagnosed as typhoid the reaction was present thirty-eight times and absent five times. Of these, in one case the reaction was not present on the second and fourth days, but appeared on the eighth. In another in which seven tests were made it was present from the fourth to the thirty-eighth day. In another it was not present on the eighth and twelfth, but was present on the sixteenth, twenty-seventh, and thirty-first days. And in still another it was not present on the twelfth day but was subsequently.

Of the remaining eighteen cases, in two the clinical diagnosis was not given, but one was a case of "high temperature some weeks after resection of the hip," and the other was a "surgical case." In eleven cases other diseases, all infectious in character, were diagnosed. In the remaining five cases the clinical diagnosis is marked with an interrogation point, but the note states that they were "not typhoid fever." In none of these eighteen cases, in which twenty tests were made, did the reaction take place. One case of doubtful diagnosis was tested three times on the fifth, sixth, and eighth days, (see XXII below,) while the others received one test each.

The author details the following five cases in which the serum failed to react, and in which the subsequent history proved the disease to have been something other than typhoid:—

"CASE I.—With this case were symptoms which closely resembled those of typhoid fever. The clinical diagnosis was made accordingly. The serum test was used, however, and the absence of the characteristic reaction from this test threw doubt upon the clinical diagnosis. More careful inquiry into the history of the case developed the fact that a few days previous to the appear-

ance of the typhoid symptoms the patient had had his nose cauterized. The diagnosis was now changed to that of sepsis, and this was demonstrated by the subsequent history of the case to be the correct diagnosis.

CASE V.—A specimen of blood was sent to the bacteriological laboratory for examination as an aid to diagnosis. The absence of the serum reaction made the existence of typhoid fever doubtful. No full history could be obtained of this case, but the statement was made that the later symptoms did not bear out the first impression as to the presence of typhoid fever. Thus the laboratory diagnosis strengthened the clinical diagnosis.

CASE XXI.—The clinical diagnosis in this case was typhoid fever. The disease was mild in character and of short duration. The attending physician classed it among the cases of aborted or cured typhoid fever, and emphasized his ability to treat such cases successfully by remarking that he had had four such cases of typhoid fever during the fall. The history of this case, briefly, is as follows: At the outset there were symptoms closely resembling those of the early stage of typhoid fever—a coated tongue, pain, abdominal tenderness, an elevation of temperature, etc.—but these symptoms quickly subsided. After but a few days' illness the patient was placed in a hospital. During her stay of one week in the hospital, her temperature was normal. A specimen of blood examined gave no serum reaction. The diagnosis of typhoid fever was undoubtedly wrong.

CASE XXII.—Here, again, is a case that might be classed with aborted or cured typhoid fever. Unfortunately, however, for any such position, repeated serum tests gave no reaction. The typhoid symptoms quickly subsided, the temperature became normal, and the patient made a rapid recovery. The diagnosis of typhoid fever was promptly abandoned by her attending physician.

CASE XXXVIII.—When first seen, this

patient had a temperature of 103° F., and other symptoms of typhoid fever. The serum test gave no reaction, however, and the subsequent clinical history did not favor the diagnosis of typhoid fever.

These four cases (V, XXI, XXII, XXXVIII), with the histories belonging to each case, would certainly point to some form of intestinal infection. At the same time they emphasize the importance of being guarded in making a diagnosis of typhoid fever. They would also suggest at least the probability that many of the so-called cases of aborted typhoid were rather cases of mistaken diagnosis."

"In all of these cases reported the blood serum was collected by the dry method (I am responsible for this). Criticism as to results may possibly be based by some upon this fact. But Dr. Wyatt Johnston has shown (*British Medical Journal*, December 5, 1896, p. 1629) that the dry method compares very favorably in accuracy with the use of fresh serum in the diagnostic application of this test. In fact, he states that 'when a negative result was obtained by the dry method the result by the fluid serum was also negative, and where on re-examination the positive result was obtained with the fluid serum, without exception the duplicate sample of dried blood also gave a positive result.'""*

In those cases where the clinical diagnosis had been abandoned, repeated examinations of the serum failed to give the typhoid reaction.

It is worthy of note that the blood specimens were submitted to the laboratory for investigation without any clinical history, and the laboratory diagnosis was based solely upon the serum reaction.

De Grandmaison reports two cases in *La*

*N. B.—In a circular issued January 7, 1897, Dr. Wyatt Johnston states that "solutions of the entire blood react more intensely to the test than solutions of blood serum alone . . . the reverse of what we had anticipated."

Médecine Moderne in which the disease was recognised only by sero-diagnosis. In both cases the test was made with but little expectation of getting the reaction, but it gave precise indications and the diagnosis was afterwards confirmed by the clinical history. The first case, that of a child nine years old, became convalescent on the thirty-first day. The second case, a man aged forty-three, succumbed on the seventeenth day to "two very abundant intestinal hemorrhages, during which the peripheral temperature was not lowered in the least. The diagnosis was fully confirmed at the autopsy, when characteristic lesions of enteric fever were revealed."

Brannan, (*N. Y. Med. Jour.*, Mar. 27th 1897), reports tests made on three groups of cases: Group I including fourteen cases of individuals suffering from typhoid fever or recently convalescent from the disease; Group II including forty-eight cases of individuals either in good health or suffering from diseases other than typhoid fever, and Group III including thirty to forty cases of persons whose clinical history was unknown to the observer. Of Group I, in nine of the cases the blood was tested during the active period of the disease, in one case as early as the eighth day. The reaction was marked in all but one of the nine cases. A case in which the test proved of value was that of a patient who had been in the hospital for eight days without our having been able to arrive at a positive diagnosis. The patient entered the hospital on the 2nd of November with a history of a three weeks' illness, sudden in its onset. His condition on the day of entrance suggested typhoid fever, but his symptoms during the next few days were not what one would look for in the fourth week of the disease. On the 10th of November some of the blood was sent to the board of health for examination, and a marked reaction was reported. The further course of the disease sustained the diagnosis of typhoid fever, and repeated

tests of the blood gave uniformly a positive result.

One case only of the nine, has given an absolutely negative reaction, though the blood has been examined four times from the tenth to the twenty-second day of the disease. The other six of the nine active cases were well advanced when the blood examination was made, and the positive result of the test simply confirmed the previous diagnosis. The dried blood of two of these cases, taken from the finger some seven weeks ago, still gives a marked reaction.

In the remaining five cases of Group I the test was not made until convalescence was established. In three the result was positive, the interval since recovery from the fever being two months in two cases and ten months in the third. The two negative cases were examined some time after convalescence was established.

In Group II the great majority of the cases failed to react at all to the serum test. In three, however—all patients in Bellevue Hospital—there was a partial reaction, never complete and unmistakable, but still as marked as is sometimes obtained in typhoid fever. The first of these doubtful cases was that of a negro with cirrhosis of the liver and ascites. He stated that he had had no fever of any kind during his twenty years' residence in New York. His blood has been examined repeatedly, sometimes with negative result, at others with a doubtful reaction. The two other patients were also of the African race, one with nephritis, the other, in a woman, with puerperal sepsis. Only one test was made in each case. Three other negroes in the hospital gave no reaction.

"Thinking that perhaps negroes were more or less immune to typhoid fever, I went last week to the Colored Home and Hospital, and with the kind assistance of the superintendent, Dr. Bickerton, I obtained blood from twelve of the patients. One only, however, of the twelve gave a

moderate reaction, a patient with diabetes. I was told by Dr. Bickerton that they had not had a case of typhoid fever for fifteen years. But this may be partly due to the fact that patients with acute disease are rarely brought to the hospital, owing to the lack of an ambulance service. In my own experience in New York I do not recall a case of typhoid fever in a negro of pure blood. I have consulted the United States Census tables, as well as the reports of the Charity Hospital in New Orleans, and have found a somewhat lower rate of mortality from typhoid fever in the colored race than among the white population."

In Group I we have seen that one patient out of nine with typhoid fever failed to respond to the Widal test as late as the twenty-second day of the disease. In Group II, of forty-eight cases which were not typhoid in nature four gave a partial reaction. In Group III, in the main, the clinical and the bacteriological diagnosis were in agreement. In addition to several instances of doubtful reaction there are three cases in which the result of the serum test has not supported the clinical diagnosis. One case of well-marked typhoid fever repeatedly failed to react to the test although made throughout five weeks of the disease. Daily examinations of the blood were made, and the reaction was negative or doubtful throughout. Another case, which had not a single typhoid symptom, gave a marked reaction from day to day for two weeks, although it was absent the previous week.

Brannan sums up his conclusions as follows:—

1. In the large majority of cases of typhoid fever the blood serum will give the so-called typhoid reaction at some time during the active period of the disease. In a small proportion of cases, perhaps ten per cent., the reaction will not be obtained, if at all, until the diagnosis has already been made from the clinical evidence.

2. In cases apparently non-typhoid in

nature, a positive reaction may occasionally occur, but probably not oftener than in one or two per cent. of the cases. This pseudo-reaction is to be attributed to the protective bodies which, as we have seen, are present to a greater or less extent in normal blood serum.

3. In a varying proportion of cases, both typhoid and non-typhoid, a partial or doubtful reaction takes place. Repeated tests are then required in order to determine whether the reaction is due to the normal protective bodies or to the specific properties of typhoid blood.

4. The serum test of Widal is a most valuable aid in the diagnosis of typhoid fever. With greater experience and improved technique its value will in all probability become even greater and more clearly defined. For the present, however, the test should not be relied upon alone, but should be taken together with the clinical signs of the disease.

Craig, (*N. Y. Med. Jour.*, Feb. 6th, 1897), gives a systematic account of Widal's method. In speaking of the value of the test he states that Widal had tried it with a great number of diseases, finding the reaction invariably present in typhoid fever, the results being negative in all other affections. Green and Ritchie gave a list of twenty-seven cases of typhoid in which the reaction was present and in many was marked. In a large number of other diseases it was not found, and in normal, healthy blood the reaction never occurs.

At the Boston City Hospital the test has been made in fifty cases of undoubted typhoid, of doubtful typhoid, and some other diseases, and in all the response "has accorded with the diagnosis as previously made, or reached later with a clearer view of the conditions."

Park states that of thirty-four cases of typhoid examined at the New York Health Department Laboratory, thirty-three showed the characteristic clumping. In the case

which failed to give it the patient had been convalescent for forty days. He concludes: "If there is no specific reaction in a case sick over a week the diagnosis of typhoid fever may be excluded. If a marked reaction occur, then, unless the patient has had an attack of typhoid fever within at farthest ten years, the case is typhoid fever."

Craig's own experience was with tests in twelve cases of disease other than typhoid fever in which the blood did not react to the test, in eight cases of undoubted typhoid in which the reaction was uniformly present, and one doubtful case in which no reaction occurred, and in which pneumonia subsequently developed.

He gives the following methods for applying the test. The method used by Widal, was as follows: Blood was drawn from a vein in the forearm with a syringe, the serum decanted, and mixed with ten to fifteen times its volume of a fresh bouillon culture of typhoid bacilli. This was left in the thermostat, at 37° C., for twenty-four hours. Later in his work, however, he found that as good results could be obtained by the use of a few drops of blood from the ear or finger of the patient. A drop of the serum of this blood was added to ten to fifteen drops of the bouillon culture, and a drop of the mixture examined at once between a slide and cover glass with a one-twelfth-inch immersion objective. If the case was one of typhoid, the bacilli were seen to lose their motility and clump together in from two to sixty minutes. He found this reaction present in no other disease. The modification of the test by Wyatt Johnston consists in using dried instead of fresh blood, thus making the transportation of specimens of blood from suspicious cases possible. Widal had noticed that dried serum and blood gave the reaction, but Johnston was the first to make practical application of the fact. He found that blood dried for from two to four weeks still gave the reaction. He describes his method

as follows: "I use a dry lens of about one-fourth-inch focal distance. The dry blood drop is partly dissolved in germ-free water, and a drop of the solution obtained is placed upon a cover glass which has just been passed through a flame and mixed with a drop of a typhoid bouillon. This is placed over a hollow cell sealed by vaseline. Uniformity of temperature is the chief detail to be attended to, as the agglutination does not take place so well if the movements are sluggish. A hot-water dish filled with warm water forms a cheap and convenient substitute for an incubator, and a simple warm stage made of a sheet of copper is also useful. In a well-warmed laboratory, however, the use of these adjuncts is unnecessary."

Where the reaction is doubtful he advises watching of the preparations for some hours, or even a day or two, when an increase of motion is noted in non-typhoid cases, and a more perfect agglutination in genuine ones.

Craig has used the following method with entire satisfaction: Upon a well-warmed glass slide, as used in microscopic work, place a small drop of distilled water. With the platinum needle take a very minute portion of a typhoid culture on agar and mix thoroughly with the distilled water upon the slide. Now moisten the dried blood drop and add a small portion to the drop of culture upon the slide and cover gently with a cover glass, being careful not to press it forcibly down upon the preparation. Examine with a one-fifth to one-eighth-inch dry objective.

Upon watching such a prepared specimen, supposing that typhoid is not present, the bacilli are seen to be in active motion, darting here and there over the field, and nowhere joined together in any number. Often two will be seen to be attached, but groups of them are not to be seen.

On the other hand, if the blood has come from a typhoid patient, in the course of from five to fifteen minutes if the disease

be well advanced—longer, if earlier in the disease—the bacilli will be seen to become sluggish in their movements, gradually collect in small groups, and finally become agglutinated in clumps containing numerous bacilli, all movement having ceased.

As above indicated, Wyatt Johnston has demonstrated that dried blood will react to the test sufficiently well to make it useful as a routine clinical method. In collaboration with MacTaggart he has presented an able article in the *Montreal Medical Journal*, "*On the Difference between Serum and Blood Solutions the Condition of the Test Culture, and the Significance of Bacterium Coli Infection in Relation to Typhoid Diagnosis.*" They give some interesting observations in regard to the reaction of the serum and blood solution to cultures of the *Bacillus coli*, of which the following is a digest:—

Very little attention has as yet been paid to the clinical significance of serum reactions with the colon bacillus. Courmont and Rodet have stated that typhoid blood serum reacts with colon cultures, while Achard and Chantemesse state that it does not. Widal states that he has studied quantitatively the intensity of reaction of typhoid serum with the *Bacillus coli*, but has been unable to draw any important diagnostic conclusions from the results.

Various observers have reported colon reaction as being present occasionally in different chronic and acute diseases. This can readily be understood in the light of our present knowledge of terminal infections. One case, which at first strongly resembled typhoid fever, but gave no serum reaction, has been recorded by Vedel, who found a marked colon reaction and looked upon it as only colon infection; this opinion has been confirmed by the subsequent events. The authors themselves found that reactions with the colon bacillus were rare with typhoid blood or serum (even in cases in which perforative peritonitis had occurred), provided the typhoid reaction was

well marked. On the other hand, they were struck by the large proportion of positive colon reactions obtained in cases having step-ladder temperature and other symptoms strongly resembling typhoid, but without the typhoid serum reaction. They think that under these circumstances the colon reaction may have a real diagnostic importance, and indicate that the colon infection, whether occurring alone or as a secondary complication of typhoid, may be playing an important part in the production of the patient's condition. The whole question of associated colon infection deserves further study.

The reaction can be tested with ease by placing a duplicate drop of blood solution or serum on the cover slip with the drop to be tested by typhoid culture and mixing with a drop of the colon bacillus culture. False reactions can be avoided by using stock cultures kept at room temperature and transplanted infrequently. Test cultures grown in bouillon from the stock at room temperature for twenty-four hours are free from scum or sediment and give reliable results. The conflicting results just mentioned may have been due to false reactions having been taken seriously.

In the case previously mentioned of apparently genuine typhoid without serum reaction (in which the test was first applied during the third week), the blood reacted very decidedly to the *Bacillus coli*, and produced typical clumping. The same held good of four other blood samples referred to the authors for examination as from a case having a clinical course like that of typhoid, but with negative serum reaction. A complete colon reaction they find to be exceptional in ordinary typhoid, and its presence would indicate a condition of *Bacillus coli* intoxication sufficient to explain the existence of many symptoms giving to typhoid its ordinary clinical features. Whether this excludes typhoid, is another question. Dr. W. H. Park has observed a case of fever with no typhoid

serum reaction in which he was able to cultivate the typhoid bacillus by spleen puncture. Later on in the case, however, a relapse occurred and the reaction appeared. The possibility of a latent typhoid infection overshadowed by toxic phenomena due to concurrent action of the colon bacillus is quite consistent with the generally accepted opinion that many of the symptoms in typhoid, and especially the intestinal ones, are due to secondary infection by the *Bacillus coli*. It follows that in severe cases of a typhoid type, with no typhoid reaction, the blood should be tested with a culture of the *Bacillus coli*, and a bacteriological study made by examination of the stools or by spleen puncture.

The conclusions reached by Johnston and MacTaggart are as follows :—

The difference in reaction between typhoid blood solution and blood serum is not simply due to varying intensity, but to an alteration in the relative prominence of the agglutinative, paralytic, and disintegrative phenomena which constitute the reaction. The extent of this difference also varies with the virulence of the culture, but the difference probably depends also on the presence of part of the specific substances elsewhere than in the blood serum.

Blood solution has a greater capacity than blood serum for producing the disintegrative (bacteriolytic) changes described by Pfeiffer. Descriptions of this phenomenon are conspicuously absent from the many recent accounts of the reactions with typhoid serum as observed in hanging drops.

The paralytic effect is relatively more marked with serum than with blood solutions.

Agglutination without stoppage of motion is more readily occasioned in virulent cultures by blood solution than by serum, and does not indicate existing typhoid.

It appears preferable that for the dried-blood method only attenuated cultures should be used. These have the advantage

of being more easily kept in readiness than virulent cultures, and are less sensitive to changes of temperature. With the serum method virulent cultures give prompt results. Dried blood serum can be readily obtained by pushing aside the edge of a blood drop which has clotted for a few minutes, but has not dried, and collecting the serum beneath it on the tip of an ivory vaccine point, or the like. This does not, however, give a quantitative result.

For ordinary diagnostic purposes, the simplicity of the method as originally described does not require modification, provided attenuated cultures are used.

A drop of the solution obtained from a dried typhoid blood drop, mixed with a drop of the culture, will give the reaction promptly, without any special attention to the degree of dilution. In order, however, to obtain the best results, it is well to dilute freely and especially to avoid having a sticky solution of syruplike consistence.

In cases in which the clinical type strongly resembles typhoid, in which the serum does not give the typhoid reaction, a decided reaction with cultures of the colon bacillus may explain the symptoms.

The results with the dried-blood test have been very satisfactory, giving uniformly positive results with genuine and well-marked typhoid cases, and not reacting with non-typhoid blood when attenuated cultures were employed.

Although the use of serum undoubtedly enables the results to be recorded and compared with greater scientific precision, the dried blood answers just as well for routine diagnostic work.

The alterations in reaction, induced by very slight modifications of the manner of testing, help to explain differences in the results reported by experienced and careful observers. With the same blood and culture, the amount of dilution possible largely depends on whether plain bouillon, bouillon culture, or water is used for diluting. Opinions also vary as to what should be

regarded as constituting a reaction. Anything less than complete clumping and total arrest of motion obtainable by the dry as well as the moist test in a young attenuated culture should not be regarded as typical.

In addition to those referred to above, excellent articles on the same subject have appeared from Gruber, of Vienna; Durham, of London; Hædke, of Berlin; Jemma, of Genoa; Pick, of Prague; Rodet, of Lyons; Block, of Baltimore; Biggs and Park, of New York; Thomas, of Brooklyn; and a host of others, the general consensus of opinion being that as a diagnostic test for typhoid fever it is of great value, and should be used in all cases in which the clinical history, while suggesting typhoid, does not otherwise allow of a certain diagnosis. As a general summary of the present status of the test, the following statements may be made:—

(a) That the blood or blood-serum, and very frequently the urine, of a typhoid patient, by virtue of a specific antitoxin, causes, when added to an emulsion of the pure culture of Eberth's bacillus in hanging-drop or ordinary cover-glass preparations, a characteristic loss of motility, with agglutination and grouping, of the bacilli.

(b) That this reaction may, and generally does, occur as early as the fourth or fifth day and is variable on the eighth or ninth, lasting generally throughout convalescence, and very often for many months after complete recovery. (Widal thinks for years in some cases.)

(c) That the antitoxin of a typhoid patient acts thus only upon the bacillus of typhoid. (This has been denied as to the colon bacillus, but the denial is immaterial from a clinical stand-point.)

(d) That the blood-serum or urine of patients suffering from diseases other than typhoid does not so affect the typhoid bacilli.

(e) That dried blood retains the antitoxin unchanged and may be used when the fresh blood or serum is unobtainable. The an-

titoxin remains unchanged in dried specimens for weeks, and probably for several months.

(f) That the test is, therefore, pathognomonic of typhoid and easily applicable to the use of public laboratories.

Flexner, in a meeting of the Medical and Chirurgical Faculty of Maryland, stated that, while we have every reason to believe that the disease comes from the germ—the bacillus—in the anatomical tract, there is no ground for believing that it gets into the body in any other way than through the intestines. This fact is based not only on the pathological anatomy, but on experiments as well; we cannot produce the disease in animals. Not all parts of the intestines are alike prone to infection to the same extent. Infection takes place where the lymphatic follicles are in aggregation, but not all the lymphatic aggregations are affected to the same extent. There is a general distribution of these lymphatic follicles throughout the whole tract of the intestines, but not all are affected in typhoid fever. The agminated glands are more susceptible to the poison than the solitary ones, and those nearer the lower part of the small intestine are especially affected. Here the infectious material of typhoid fever is kept a long time, owing to the anatomical character of the parts. The ulceration produced by the bacilli may be very superficial, affecting only the mucous membrane, or the whole thickness of the intestinal coats may be affected, causing perforation.

Many epidemics are from an infected water-supply. The organism of this disease is not particular as to where it lives, and can thrive in water a long time, as well as in milk. It is difficult to discover and separate it from other organisms. The growth is often invisible and causes no change in the color or taste of the milk infected, nor does it cause coagulation. This fact helps in its recognition, because the organisms with which it is confused grow visibly, and re-

cent methods allow the typhoid germ to be discovered in the intestines. By the use of the differentiation method of Elsner, (*see below, p 150*) in culture-media of varying acidities, the growth of the typhoid organism in plate culture may easily be separated.

Wilson of Montreal presents a case, in the *Canada Medical Record*, of what he calls "Afebrile Typhoid Fever." He admits that in this case Ehrlich's test of the urine was not made, Widal's serum test had not yet been brought to his attention, and the stools were not examined microscopically. The case, however, presented such a clinical picture of a typical typhoid attack of moderate severity, that he reported it.

The man, aged thirty, a brass finisher, was taken sick on October 4, with headache, lassitude, pains in the back and side, stomach felt upset, appetite failed, and sight of food was repulsive. When seen on the 13th Oct., the appearance was typically typhoid. Face dull, eyes heavy, forehead drawn, tongue coated white with raw red edges, but large and moist. Abdomen tympanitic on right side, duller on left side, gurgling distinct in right iliac fossa, with marked tenderness on pressure with flat hand. Spleen enlarged and felt at margin of ribs, dullness extending up to 8th rib, axillary line tender to pressure. There was a profuse eruption of raised papules, discrete, from a mere point to a little larger than a pin head, bright rose-red, inclined in places to be semi-pustular, disappearing on pressure (except latter), coming out in successive crops (marked). Patient says they were there two days previous to first call (*i. e.*, October 11th, 1896). Particularly profuse on abdomen, tapering off towards flanks and upper chest. Temperature 98.6° (two thermometers), pulse 64, respiration not counted, but apparently normal. Examination of lungs and heart negative, no cough, never felt feverish or hot, but simply dull and stupid, with the pains in right iliac region and left side.

Bowels constipated. Placed the patient on liquid diet for four days, and gave no medication, anxious to watch the case. The temperature and pulse did not vary a fifth of a degree. The patient returned to his work on the 10th of November,—four weeks and six days from onset. At no time did the temperature vary more than .2 of a degree F., although at one time three thermometers was used as controls. Whether the case was one of genuine typhoid, or one of those obscure cases of gastrointestinal disturbances associated with obstinate constipation, in the absence of bacteriological proof, is hard to say; the clinical condition was that of typhoid, whether induced by the poison of Eberth's bacillus, is another matter. Absence of proof does not necessarily negative the possibility, although it invalidates it for statistical purposes."

Curtis, of Albany, read a paper before the Medical Society of the State of New York, on "The Life History of the Typhoid Bacillus outside of the Body," in which he said that the typhoid germs remained indefinitely in the soil, but probably did not retain their vitality for many days in sewers, cesspools, and privy vaults. These bacilli retained life for a long time in running water, and were not destroyed by freezing. Aerial transmission of the disease was possible only when the germs were taken into the digestive tract.

At the same meeting, Northrup, of New York, said that not a single case of typhoid fever had been known to occur among the many thousand children that had been under the care of the New York Foundling Asylum during twenty-five years, and he had never met with the lesions of this disease in two thousand autopsies made upon children under three years of age. Out of the four hundred cases of typhoid fever in the epidemic at Stamford, there had been only four among little children.

In the *Annales de la Policlinique de Bordeaux* for March there is a long and

comprehensive article on the "Clinical Peculiarities of Typhoid Fever in very Young Children," by Rocaz, of which the following is the substance :—

The onset of typhoid fever in young children is more frequently sudden than in adults, and its appearance is often marked by a sudden elevation of temperature, the thermometer rising in a few hours from normal to 104° F. and more. Rillet and Barthez think this sudden onset indicates an altogether peculiar gravity of the disease.

The intestinal symptoms are generally less marked in children than in adults. There is a rather exact relation between the number and extent of the ulcerations on the one hand and the age of the patients on the other hand. The younger the children the fewer and smaller the ulcerations. Constipation is the rule during the early days of the disease; it is obstinate and does not yield sometimes until after the administration of several purgatives. When it does not continue during the course of the disease, it is replaced by a slight diarrhœa which presents nothing characteristic. Hence it may be readily understood that intestinal perforation and hæmorrhage are excessively rare in very young children. Enteritis, on the contrary, is a more frequent complication in children, and it is characterized by the persistence of the diarrhœa after defervescence; this diarrhœa is rebellious and sometimes requires energetic treatment and a strict diet. Vomiting is frequent enough in children to be regarded as a part of the regular train of symptoms of the disease. Lack of appetite in young children is so pronounced as to become almost a veritable danger. M. Moussous has cited two cases in which the children refused everything, except a few mouthfuls of pure water, for twelve days.

With regard to the appearance of the tongue, the author states that in many cases observed by him in very young children, in which the temperature rose to

102.6° and 104.5° F., the tongue remained moist.

The temperature is very nearly like that observed in adults, although it often assumes a less regular progress in children. This irregularity has led to much discussion in regard to its prognostic value. The only fact that seems to the author worthy of mention, concerning the temperature in young children, is the very frequent occurrence of hyperthermia and the facility with which it is borne by the patient.

Dicrotism of the pulse has never been observed in very young children. During the height of the disease the pulse is generally regular, ranging from 100 to 140 pulsations a minute. During defervescence and convalescence, however, it may present a peculiar characteristic which has been fully dwelt upon by de Gassicourt and Revilliot, who occasionally saw the pulse become slower and present irregularities which caused it to resemble the pulse in certain stages of meningitis. This peculiarity, which lasted from eight to fifteen days, did not seem to have any unfavorable significance. The irregularity of the pulse in the febrile period is more serious, for it indicates then a cardiac exhaustion which often presages death. The heart, however, is rarely seriously involved in typhoid fever in young children; myocarditis is exceptional and always slight, and sudden death has been observed only two or three times.

Thoracic symptoms are in the normal forms less marked than in adults, although broncho-pneumonia is a very grave complication in abdominal typhus in children under five years of age.

Lenticular rose-colored spots are the only pathognomonic symptom of typhoid fever in young children; they present no peculiar characteristics either in their frequency, their time of appearance, or their prognostic importance. Epistaxis is considered by the author as being altogether exceptional in young children. Sudamina are frequently

observed, and they generally appear shortly after the red spots. Livid streaks near the articulations, particularly the knees, are peculiar to infancy, and they are due to an increase in growth which is sometimes surprisingly rapid. The frequency of desquamation is also a peculiarity of infancy.

With regard to the possible complications of typhoid fever in young children, the author mentions those of the nervous system, which, he says, are seldom observed in children under five years of age.

Other complications, such as arthritis, otitis, thrush, torticollis, stomatitis, and phlegmasia alba dolens, are also frequent in very young children. Abnormal eruptions are more frequent in children than in adults.

The duration of the fever is shorter in infancy. According to some authors, relapses occur more frequently, but they are usually less serious than the first attack.

Convalescence is, therefore, rather rapid, and the child recovers with a rapidity that is sometimes astonishing. The aphasia of convalescence, which is very frequent in children, is nearly always curable.

The prognosis of typhoid fever in young children is dependent upon their age. It is very grave in children under three years of age, not so serious at four years, and nearly always favorable at five years and over.

Ubiquity of Typhoid Bacilli.

Elsner's method of differentiating and isolating typhoid bacilli (*Zeitschrift für Hygiene* xxi, 25) has been tested, practically verified, and approved by Remlinger and Schneider (*Annales de l'Institut Pasteur*, January 25, 1897, p. 55) as well as by others, and therefore his article seems one of the most important of the seven hundred or more that have appeared upon this vexed subject. His simple method appears to be the only reliable one for the almost certain recognition of typhoid bacilli living in water or elsewhere among various other bacteria. Making a thorough and systematic research with hundreds of chemical agents,

from resins and oils to animal products and alkaloids, and trying carbolic acid and naphthol, of course, he found that by the addition of one per cent. of iodide of potassium to potato gelatin other bacteria than the typhoid and colon varieties were almost entirely suppressed. The colon bacteria appear and develop into brownish colonies on the second day after they are introduced. Typhoid colonies come more slowly and are small, water-droplike, very finely granular, clear, and transparent. This culture medium is prepared by cooking gelatin with potato maceration (*Auszug*) of one pound of potato to a quart of water. Then normal caustic-soda solution is added till only slight acidity is revealed to litmus tincture. After filtering and sterilizing it receives one per cent. of potassium iodide.

Remlinger and Schneider note that certain other bacteria may develop in this excellent medium, and that some of the colon-bacilli colonies may simulate the typhoid ones. Hence always checked their tests by use of the microscope and the familiar means of distinguishing typhoid from other varieties, typhoid characteristics being (1) appearance of gelatin cultures, (2) active mobility, (3) many cilia, (4) non-coloration by Gram's method, (5) gas not produced by bacilli cultivated in sugary media, (6) non-coagulation of milk in which they are cultivated, (7) absence of indol in cultures, (8) acid reaction of whey cultures, (9) peculiar growth on potato, (10) tardy in Maasse's solution (asparagin, common salt, malic acid), to which glycerin is added, (11) inability to develop on a culture medium in which typhoid bacillus has already grown, (12) clumping or agglutination seen when typhoid bacilli are added to serum of a horse immunized against typhoid (Widal's procedure). If a bacillus presents all the typical biological and morphological qualities of the Eberth bacillus and is pathogenetic toward animals, but ceases to be so when the animal experimented upon has

received a weak dose of the Widal serum, it nowadays seems safe to call the bacillus typhoid.

Employing all these checks upon the bacteria developed on the Elsner medium, these observers detected typhoid bacilli in nine out of thirty-six samples of drinking water from various places, two being from towns where the disease was prevailing at the time. Six were from places where the fever had disappeared. The carbolic-acid test failed to detect any, but the Elsner method showed the presence of a few characteristic bacilli in the water for three months after the last case. In two cases the bacilli disappeared from the water promptly upon the cessation of the epidemics. In the cases where typhoid bacilli were found there were not many other bacteria and the water was chemically very pure.

Thirteen samples of earth and of dust taken from different localities were examined. In seven of these the typhoid bacillus was found. One was from the bacteriological laboratory where these experiments were pursued. Another was from the sweepings of barracks where typhoid had occurred. Out of six general hospital cases that had not ever had typhoid fever or its symptoms the fæces showed the typhoid bacillus in five of the cases. In many other cases bacilli were detected identical with the typhoid bacillus, except as regards their virulence upon animals and their reaction to the specific serum of Widal. Remlinger and Schneider accordingly feel disposed to question the absolute value of the serum test in all cases of typhoid bacilli, reasoning, by analogy, that not all virulent cholera vibrios react to Pfeiffer's serum test. A fair inference is that both these important disease-causing bacilli have several varieties. The more we study bacteria the less evidence exists to support the theory of the invariability of types. This being so, it is reasonable to consider that the typhoid germ is more or less widely diffused throughout Nature. This helps us to ex-

plain cases regarded as of doubtful origin, where the usual factor of contaminated drinking water is not demonstrable.

HOW LONG CAN TYPHOID AND OTHER PATHOGENIC BACTERIA REMAIN ALIVE IN WATER?

Klein (*Annual Report of the Local Government Board for 1894-'95*; and *Centralblatt für Bakteriologie*, etc., November 5, 1896) gives the results of experiments made to determine this question. In sterilized distilled water cholera germs died within two weeks. Typhoid seemed to increase at first, then to decrease; but some typhoid bacteria remained alive in distilled water for more than three months. In London water, from the rivers Thames and Lea, sterilized simply by filtration through porcelain, typhoid bacilli disappeared entirely within eighty-five days. In similarly filtered hard spring water they survived somewhat longer than in the river water. Cholera bacilli survived less than half as long as the typhoid in these waters. When only a few bacteria were introduced, they perished sooner than if many were introduced. Very notable is the finding of this distinguished worker: that bacilli of cholera remained alive in unsterilized common London hydrant water for more than forty-two days, in spite of the antagonistic action of the usual water bacteria present! Typhoid bacilli survived only from thirty-six to forty-two days; in hard water from a certain spring, these lived less than five days, while in rain water and well water they lived longer. The *Bacillus coli communis* did not show any greater vitality than typhoid. Klein states that by filtering considerable quantities of various waters and then examining the resultant slime, he has in a number of cases been able to detect typhoid bacilli.

PROTECTIVE INOCULATION AGAINST TYPHOID FEVER.

In the *Edinburgh Medical Journal*, Pfeiffer and Kolle have recorded the

results of researches upon this subject. Following the analogy of Haffkine's investigations into the protective inoculation against cholera, they decided to investigate the effects of the introduction of a small quantity of killed typhoid bacilli in man. The authors used a typhoid culture which had been made from a spleen two months previously, and the genuine character of which was proved by the specific reaction with the blood serum of typhoid convalescents. The virulence of the culture was very marked. Individuals were selected who were either in good health or at least free from febrile symptoms, and who were known not to have enteric fever. One c. cm. of a bouillon preparation, so completely sterilized at 56° C. that it contained no living micro-organisms, was injected. A few hours after the inoculation the first symptoms appeared of shivering, vertigo, etc. The evening temperature rose to 38.5° but it fell to normal during the following day. From their experiments with it on animals it became obvious that a single injection of a minimum dose of killed typhoid cultures induced in man a specific change in the blood, which was apparent six days after the injection, and which attained at least the same degree as is visible in typhoid convalescents. It is more than probable that the appearance of specific bactericidal substances in the blood of individuals who have had typhoid fever represents the chief cause of the immunity possessed by them. If this is correct, then it is to be expected that these prophylactic inoculations with killed typhoid cultures can produce an immunity of equal intensity and duration as that found after an attack of typhoid fever. Haffkine's analogous, very numerous, successful, and practical investigations lend support to the same view. The authors hope that these protective inoculations against typhoid fever will be of practical service under certain circumstances, such as the prevalence of a severe epidemic, etc. The material for inocula-

tion can be provided with comparative ease. They refer especially to its possible value in cases of sieges when enteric fever often decimates an army. Baieger, Wassermann, E. Fraenkel have used killed typhoid cultures in the treatment of enteric fever, but not for its prevention. Individuals with typhoid fever react quite differently from healthy persons, but even in the developed disease such injections have been known to produce a beneficial even though temporary effect.

At the same time, and apparently independently of these observers, Wright and Semple, of Netley, have made investigations in the same direction, and have recorded their observation in the *British Medical Journal* of Jan. 30th, 1897. They report that with large doses of the culture the symptoms are severe; in two or three hours after injection there is a certain amount of local tenderness which gradually increases in severity and extent. A patch of congestion, two or three inches in diameter, develops around the site of the inoculation. Red lines of inflamed lymphatics may be traced upwards towards the armpits. Local tenderness is most marked twelve hours after and disappears forty-eight hours after the injection. The constitutional symptoms consist of some degree of faintness and collapse which make their appearance in two or three hours. There are also nausea, vomiting, anorexia, fever, and insomnia. These symptoms disappear in from twenty-four to forty-eight hours and take place even in patients who have received from forty-five to sixty grains of calcium-chloride crystals which are administered to prevent the occurrence of decrease in blood coagulability and edema. Eighteen inoculations were made, and examination of the blood of these patients at different times shows that that fluid has become in some measure poisonous to the typhoid bacillus, since it agglutinates the bacillus. Experiment shows, however, that patients whose blood possesses a sedimentat-

ing power upon the bacilli are not absolutely protected against typhoid, although the possession of a sedimentation power denotes the possession of a certain measure of "bacteria proofness" against the bacterium in question. The injection of small and measured quantities of these dead bacterial cultures involves no more risk to life or health than the injection of a medicinal dose of morphine. The duration of the immunity is not definitely known, but the serum diagnosis ought to give an indication when the immunity is lost. The authors claim that since the symptoms can be controlled by calcium chloride, and since the adequacy of the inoculation can always be controlled by a blood examination, it will be expedient for every one who is likely to be exposed to the risk of typhoid infection to undergo the inoculation.

THERAPEUTICS OF TYPHOID FEVER.

Whenever treatment has been referred to in the papers reviewed, balneotherapeutics has seemed to be the most in favor, the method of Brand, or some modification of it, being the one usually employed. Injection of sterile solutions of dead typhoid bacilli were made in a few cases with variable results. If the commonly accepted theory of toxins and antitoxins be correct, this latter procedure would seem to be an irrational one, as only adding the toxins of typhoid to a system that was already suffering from their effects. Unfortunately, the manufacture of the antitoxin of typhoid fever on a large scale, as is done in the case of diphtheria antitoxin, is not possible, owing to the apparent immunity of most animals to this disease.

Ely, in a paper read before the Medical Society of the State of New York, calls attention to the uselessness, and frequent harmful effects, of antipyretics, as well as that of the antiseptics which are given internally, such as guaiacol, salol, and the like. He pleads for greater attention to hygienic conditions and dietetic treatment;

and above all things, fresh air and pure water. Careful handling of the patient on the part of the nurse, in order to prevent excoriations and bedsores, is much to be desired. Frequent cleansing of the mouth and teeth, and in cases of vigil, the moving of the eyelids frequently to prevent drying and consequent ulcer of the cornea, will all be seen to by a good nurse, and should be suggested by the physician. In short, making the patient as comfortable as possible, and preventing, as far as may be, the arising of any irritating or exhausting condition, will husband his strength to carry him through the self-limited term of this disease. Milk is the article of diet relied upon, and "two quarts a day is a minimum amount for the average case." It should be given by night as well as by day, and where it is rejected, should be given in smaller quantities more frequently. An amount of milk given every three hours and rejected, can be given in divided portions every hour, or half hour, and be retained. "I once saved a patient's life by slipping one half ounce of nourishment into the stomach every fifteen minutes—ninety-six times each twenty-four hours—for several days; large amounts at longer intervals invariably caused vomiting. As nervous force is rapidly consumed by persistent high temperature, its duration must determine the amount of food given. Milk may often be supplemented by beef-juice and eggs. In exceptional cases where exhaustion has been marked, I have given twenty whole eggs, or the whites of forty eggs, every twenty-four hours, with benefit."

In the *British Medical Journal* for Jan. 16th, Barrs pleads for a less restricted diet in typhoid fever. He has adopted a new method of alimentation in this disease which includes the giving of more or less of certain solid foods throughout the disease, and especially from the beginning of the stage of convalescence. He has not yet used it upon a sufficiently large number of cases to warrant any positive con-

clusions upon all aspects of the question. He states that out of thirty-one cases of typhoid fever only three patients died, and in these three cases no solid food could be given. He does not believe that it will have any influence in causing relapse, remarking that if the disease is caused by a specific infection, a little bread and butter or meat could scarcely precipitate a second attack. He believes that the increased alimentation will hasten the healing of the ulcers, and thereby lessen the liability to perforation. He lays it down as a principle that, "whether a patient likes a thing or not, depends upon his appetite for that particular thing, and as a rule an appetite for any particular thing is a pretty sure indication that it will agree; that is, it will be digested, absorbed, and assimilated in due and normal course, and will tend to the well-being and not to the undoing of the patient;" and he states that his rule, then, in typhoid fever, is to give the patient such wholesome food, solid or fluid, as he can take, using the word take to mean that he likes it, and wishes for it, and enjoys it.

By this he does not mean "forced feeding," but allows the tastes and desires of the patient to more or less determine the kind and quantity of food taken. Dr. Barrs' suggestion is certainly in line with the thought of the profession in regard to the treatment of this disease. The points upon which others might differ from him are: 1st, the danger of perforation, and 2nd, the power of the system to digest and assimilate the kinds of food he suggests. For instance, the digestion of beef, even though chopped fine as he recommends, could scarcely go on in the almost entire absence of hydrochloric acid in the stomach found in this disease. Whether giving hydrochloric acid with the beef would supply the deficiency could alone be determined by experiment. Predigested foods naturally suggest themselves in this connection.

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THE MODERN METHOD OF TREATMENT OF DISEASE OF THE INTESTINES.

By FENTON B. TURCK, M.D., Chicago.

In the *New York Medical Journal* of
March 13th and 20th, 1897.

Most intestinal diseases present the same pathological conditions as are found in diseases of the stomach. The same etiological factors that induce gastritis may continue down the alimentary tube, causing an irritation resulting in enteritis. The etiological factors of enteritis comprise a long list, among which are found diseases of other organs, acute diseases, errors of diet, fevers, and nervous diseases of central and peripheral origin. Under certain conditions in which the functions of the intestines and colon are disturbed, micro-organisms develop upon the walls of the intestinal tube. Toxines are formed by the development of these micro-organisms in the rich soil adhering to the mucous membrane and affect the cells beneath, causing a disturbance of the glandular functions, with marked circulatory changes and derangement of the muscular mechanism. The ordinary treatment in vogue is the attempt at antisepsis, which frequently fails, as an infected tube twenty feet long, like the intestines, cannot be sterilized by a few grains of any antiseptic. Most antiseptics are systemic poisons, and increased doses sufficient to produce antisepsis are contraindicated. The study of infection of the intestines shows two conditions: First, the food may become a medium for growing micro-organisms, the toxins of which, on absorption, produce a systemic poisoning. Second, the mucous membrane of the intestines becomes coated with thick mucous, similar to that which I have found adherent to the mucous membrane of the stomach in cases of gastritis,—gland cells, leucocytes, and remnants of food.

The protoplasm of the exfoliated cells and the partly digested food furnishes a rich soil for the rapid development of

micro-organisms. The indications for treatment are to remove the media in which the micro-organisms develop and thus deprive the pathogenic germs of the material in which they produce their toxins, and not simply to disinfect the food that passes down the tube. The first indication is to begin treatment at the upper end—the stomach. As errors of diet are the most important factors in the ætiology of gastro-intestinal diseases, the most rational therapeutics would be the correction of these errors.

If fermentation and putrefaction arise in the intestines they are due only to two factors: First, the presence of a soil for the development of micro-organisms. Second, the micro-organisms. In four to twenty-four hours after the birth of an infant its entire alimentary tract is swarming with bacteria, such as the *Bacillus coli communis*, *Bacillus, pyocyaneus*, streptococci, staphylococci, and saprophytic germs. Germs are found in every intestinal tract. All that is necessary for infection is that the conditions be made favorable for their rapid development and the proper medium best suited for the production of toxins.

After the correction of the errors of diet the intestines must be rendered aseptic to a certain extent by the removal of the culture media and by the restoration of the secretory and muscular functions. The indications are: (1) to lessen or remove the ætiological factors; (2) to remove the adherent material from the walls of the intestines and render the tube as aseptic as possible; (3) to restore the muscular functions; (4) to reduce the congestion of the viscera.

Correction of Errors of Diet.—It is impossible to formulate rules of diet that will be applicable to all cases. Prescribe no food that undergoes fermentation or putrefaction. The use of chopped meat in the beginning of treatment, with diabetic flour and bran has met with the most brilliant suc-

cess. The methods of preparing the chopped meat must be varied, as the patient soon tires of so simple a diet. It may be made into patties one by three inches, broiled, frequently turned. Scotch collops are made by covering the meat with water and allowing it to stand for a few hours on the stove (at a temperature below boiling point, so as not to coagulate the albumin). It makes a semi-solid mass, and is served in little China dishes (cachets). A lump of fresh butter and, when not contraindicated, salt and pepper are used. Raw meat is also much used. Patients soon learn to relish it. Raw meat sandwiches are recommended by Thompson (quoted from *Food*). Three ounces of raw beef or mutton, one ounce of very fine bread crumbs, and one teaspoonful of sugar are used. Cut the meat very fine; rub it through a hair sieve. Then pound it in the mortar to a paste; mix it with bread crumbs and sugar and a little salt and pepper; spread it between the slices of either brown or white bread. My custom is to vary the preparation of the food with every meal. In a large number of cases I find that patients do better on two meals a day. The increase in diet must be regulated by the physician.

Use of Bran.—The use of bran in gastro-intestinal diseases, while not new, is not appreciated by the general profession as it should be.

Preparation of Bran.—Procure coarse bran taken from the feed store. Heat it in the oven at 150° C. in order, first, to sterilize and, second, to transform the starch granules present into dextrin.

I use bran gems by mixing the bran with water, adding a small amount of Graham flour to make it adherent, then a little salt, and baking in iron gem forms, the same as are used in baking Graham gems. Serve at once with pure fresh butter. Most patients relish the gems as prepared. Another method is to combine bran with flour, usually using gluten flour, making bread the same

as ordinary bread, seventy-five parts flour and twenty-five parts bran. Bran gems should be eaten in the morning, and are sometimes useful two or three times a day.

Action of Bran.—The bran particles being insoluble and indigestible, assist in grinding the food. The bran particles mixed with the food, passing between the food particles allow the gastro-intestinal fluid to come in closer contact with the food to be digested. The sharp edges of the bran, as it makes the excursion through the gastro-intestinal tract, have a marked mechanical effect. First, it helps to remove the adherent mucus, with the other material mentioned, from the walls of the tube. In examining fecal matter after a liberal diet of bran, thick, glue-like mucus will often be found with gland cells from the walls. The mechanical action of the bran is similar to that of sand or shot with water used in cleaning bottles. In this way the bran acts as an aseptic agent, assisting in the removal of the nutrient media from the intestinal wall in which bacteria flourish.

The bran, while hastening the digestion and absorption, is not digested and absorbed itself. Therefore it furnishes the necessary bulk to assist in carrying off the food and any other material that is not utilized in the process of digestion. The presence of bran is not harmful, as it does not furnish a medium for the development of micro-organisms. The fecal matter is often retarded along the transverse colon, which is frequently dilated and prolapsed. The bran acts here also as a muscular stimulant, increasing the secretion and facilitating the passage of fecal matter through even a dilated colon.

It will be noticed that in many cases where putrefactive conditions are present (often indicated by offensive stools) the use of bran treatment results in a marked improvement in the character of the stools. The offensive odor of the stools disappears in from twenty-four to thirty-six hours.

In the treatment of infants, where the

infection of the alimentary tract is present with undigested milk food and offensive stools, a marked improvement has been noticeable in a short time by the use of the bran treatment. The bran mixing with the milk produces a flocculent mass instead of caseous lumps, which latter are powerful gastric irritants; moreover as they are large and insoluble, the ferments are incapable of dissolving and digesting them.

Methods of administering Bran to Infants.—For an infant five to ten months old a half teaspoonful to one teaspoonful of very finely sifted, sterilized bran is mixed with four or five ounces of milk and injected into the stomach once or twice daily. The amount of the bran may be increased with the age of the infant.

Method of Injection.—A small catheter, No. 11 or 12 with the opening at the extreme end, is attached to a syringe filled with a mixture of the milk and bran in the proportion stated. The tube is then passed rapidly into the stomach. It is not a difficult matter to feed infants in this way; it is easier to pass the tube in infants than in adults.

When the passage of the tube is impracticable the mixture may be fed with a nipple having a large opening. The nurse holds the bottle in a high position and shakes it to prevent the settling of the bran particles into a mass. Or the infant may be fed by a spoon. The best plan is to use the tube and syringe, as the particles of bran often irritate the larynx.

The injection of the bran can be accomplished at the same time that the stomach is washed out, which is often necessary in the treatment of such cases.

Use of Cloves and Cinnamon.—To further assist in rendering the tube aseptic I have used a coated pill of oil of cloves and cinnamon. The pill consists of hard soap, three grains; oil of cloves and cinnamon, one drop each, made into a pill mass and placed in gelatin capsules. These capsules are thinly coated with Plaster of Paris. After

being hardened it is dipped into a mixture of shelac dissolved in alcohol mixed with betol. About four coats will suffice. One pill may be given every hour or every two hours according to circumstances.

Treatment of Sigmoid and Colon by Direct Methods.—The most common pathological condition found is chronic colitis simplex, chronic membranous colitis associated with symptoms of diarrhoea and constipation. The colon may become dilated, most generally the transverse colon. With prolapse the sigmoid is frequently found dilated with elongated meso-colon. In the treatment of the stomach and colon it will be found that the intestines are also affected, especially by some of the following methods: First, by the introduction of ice water with massage of the colon; second, by the method of irrigation by the use of the needle douche, with alternating hot and cold water; third, by the use of the hot-water bag with double tube within the stomach or colon; fourth, by application of oil of cloves and cinnamon through a double tube with a nebulizer; fifth, by the use of the gyromele.

Ice water is introduced into the colon through a single tube. The patient is placed with the hips elevated, so that the water will run up the colon. Then it is massaged downward until it reaches the cæcum. The water in the colon can be traced, first, by percussion; second, by succussion; third, by Benedict's method of auscultatory percussion. When the water has reached the cæcum the hips are lowered and the cold water is massaged out of the colon through the rectal tube and runs into a receptacle placed beneath the operating table. The amount of water introduced each time is from four hundred to six hundred cubic centimetres. This alternating injection and expulsion is continued until three to four litres have been used. The introduction of ice water directly into the colon stimulates the congested vessels in a marked degree. No chilling or depress-

ing effects are produced, as when ice water is applied externally. Another valuable factor is that it does not remove the secretions of the colon to the same extent as warm water. Secretions are essential for lubricating and facilitating the passage of faecal matter through the colon. Warm water is a vaso-dilator, and, when rectal injections are taken in the usual manner, harm results, producing weakness and inducing the injection habit, and also increasing the symptoms of constipation. In the ice-water treatment with massage, pressure should be exerted on the abdomen with the patient's knees flexed. In this way the colon can be reached by massage. It is necessary to use both hands, the left hand being placed over the right, and pressure should be gradually exerted until it is made directly on the colon and its contents.

The Use of the Double-Tube Needle Douche for the Sigmoid.—The stomach needle douche consists of two single tubes of different calibre arranged side by side, the large tube projecting beyond the smaller tube. At the end of the smaller tube is attached a small perforated bulb for producing a shower. The smaller tube is also made with perforations along its side and over the blind extremity. The water is forced into the smaller tube under pressure by the compressed-air irrigator. The effect is to produce a fine shower or needle douche, hence its name.

In cases where the sigmoid and lower colon become markedly dilated and atony is present, with congestion of vessels (which can be diagnosticated by direct observation), the use of alternating hot and cold water by the "needle douche" is of great value.

For general purposes I have not found it necessary to use a force pump to compress the air, and have simply used a small rubber bulb similar to that used with an atomizer. When hot and cold water are used alternately two irrigators are necessary. The irrigators are made in the usual way.

A bottle, through the cork of which a glass tube passes, is connected with a rubber bulb. By compression of the rubber bulb the air is compressed over the water in the bottle. This compression forces the water out of the bottle into the irrigating tube. Thus a forced shower is produced under pressure by compressing a single bulb. By using a glass Y-tube, connected with a single bulb attached to the stem of the Y, the ends of the glass tube being attached to the rubber tube, which again leads to each bottle—namely, the hot and cold water—the air is compressed in both bottles. The outflow tubes from the irrigators are connected with another glass Y-tube, the stem of the Y-tube being connected with a single rubber tube. Hot and cold water can be used alternately by having a simple cut-off snap on the tube leading from each bottle. A mechanical stimulation is produced by the impact of the small needle-like streams emanating from the perforated tube, and the circulation of the whole pelvic viscera is affected and the tone increased.

Use of the Nebulizer with Double Tube.—

This apparatus was first described and shown before the American Medical Association, May, 1885, in which attention was called to the use of nebulized oil of cloves and cinnamon and other oils for the treatment of the walls of the stomach. The nebulized oil of cloves passes down one side of the double tube, in the form of a cloud, into the cavity of the stomach. The entire walls are thus coated, and as the stomach becomes distended by the air introduced the contraction forces the cloud out through the other side of the double tube. I have discovered that the introduction of air with the nebulized oil of cloves and the resulting contraction forcing the air out of the stomach produces a pneumatic gymnastic, giving strength and tone to the weakened muscles of the stomach.

I use this method of treatment in diseases of the colon, especially when it is

dilated with a lack of peristaltic movement. I also use this for diagnostic purposes in both the stomach and colon, as the degree of distensibility and expulsive force can be readily determined. The double tube is passed through the rectum into the sigmoid, the nebulized oil of cloves and cinnamon passes upward, and as the colon becomes distended the air forced into the colon carries with it a cloud of essential oils reaching the cæcum. The cloud of oils forms a thin coating on the mucous membrane, and this thin coating remains for a long period of time. Besides retarding or preventing the development of micro-organisms upon the wall of the mucous membrane the essential oils named are vasomotor stimulants.

It will be seen these oils act as antiseptic agents and vasomotor stimulants, overcoming the congestion found in these cases, and, in combination with the pneumatic gymnastics, providing a simple and effective method of treatment of the colon.

In cases of membranous colitis, atony of the colon, dilatation of the sigmoid, with symptoms of constipation, the gyromele has been found to be of great value. The instrument was described and shown by me at the International Medical Congress, Rome, 1894, and was first used in gastric diseases in the treatment of inflammation (chronic) with symptoms of myasthenia (muscle weakness). A sponge attached to the end of a cable is passed into the organ through the rubber tube, at the end of which is an apparatus for the purpose of revolving the sponge.

Method of Use.—The sponge is passed through the rectum up into the sigmoid and rapid revolutions are produced. In some cases I have been able to pass through the sigmoid into the colon, which was demonstrated by the palpation of the revolving sponge upon the abdominal wall.

The principal value of the use of the gyromele in the colon is: (1) Removal of adherent material, such as scybalæ. It is

effectual in membranous colitis used with liquid soap. Liquid soap helps to loosen the glue-like substances. The agitation caused by the rotary movement, together with the effect of winding off the adherent material from the walls, cleanses the surface. The loose material can then be easily removed by the use of the double-tube needle douche used with the pneumatic-force irrigator.

(2) The use of the gyromele in the colon has a similar mechanical massage effect as in the treatment of stomach diseases. This is especially valuable in dilatation with myasthenia or "muscle weakness." The vibratory effect of the revolving sponge and cable shows itself in increasing peristaltic movements of the intestines. The vibratory effect can be felt upon the abdominal wall, and in thin subjects the vibratory waves can be readily observed. Since vibratory movements have been shown to have a marked effect upon the circulation, stimulating the dormant muscle cells into activity and thus aiding cellular nutrition, this treatment has been recognized as a method of considerable value. It is especially valuable in dilatation and atony of the sigmoid.

(3) When it is desired to apply medications by topical application they can be injected through an opening made for that purpose at the upper end of the gyromele. Antiseptics, astringents, or medicaments may be used in any menstruum, thick or thin, as deemed best.

(4) The gyromele is also used in the application of electrical treatment. The moist sponge acts as an electrode. I have used electrical treatment by introducing one gyromele into the stomach and another into the colon, using intra-electrization with the faradic or galvanic and also the sinusoidal current, as the latter is alleged to produce painless contractions.

In general treatment, such as hydrotherapy and exercise, when good results are

obtained we cannot always give a scientific rationale.

The bath that I will here describe has for its objects (1) the reduction of the congestion of viscera by causing a distribution of the blood over the surface of the body; (2) the elimination of toxins; (3) increase of the autitoxic and antiseptic effect of the blood (the defensive proteids), called alexins, derived from the leucocytes.

The Technique of the Bath.—The patient should be placed in a bath tub filled with water at the temperature of 100° F. The temperature is then rapidly raised to 110° F. The patient is instructed to lie quiet, as movements, like throwing the arms out of the water, will give a burning sensation by contrast of the air with the hot water. The temperature is increased to 112°, 114° or 115° F., until the whole surface shows a crimson red, indicating arterial injection of the peripheral vessels. The temperature of the body will show a rise of 1° or 2° F. As soon as the surface assumes a scarlet hue, which will require ten or fifteen minutes, the patient is removed from the water and seated on a board placed across the bath tub, the feet resting upon the end of the tub; then the patient is rubbed over the entire surface with a block of ice weighing a pound or two. This is repeated four or five times. No shock is experienced even by delicate patients, as the high temperature of the water produces a modified anæsthesia of the skin. It acts as a powerful stimulant, without shock and without the enervating after-effects of hot-water baths. The temperature of the body is quickly reduced to normal by the ice massage.

In cases of great vasomotor weakness, and in the functional disturbances known as "weak heart," lying down for an hour after the bath may be resorted to if found necessary. It reduces the congestion of the veins of the viscera, as I have found in experiments upon animals.

There is an increase in both the red

corpuscles and leucocytes which is shown immediately after the bath, and indicates that certain anæmias are due to congestion rather than to reduction in the number of corpuscles. As the bath stimulates excretion by the increased blood current, the skin, kidneys, and liver are bathed with arterial blood. I find the bath also of use for diagnostic purposes in determining the condition of the circulatory system. The promptness or delay of the response to the stimulation while in the bath, the condition of the patient after the bath, the character of the pulse, and other symptoms which may develop that were not shown before, are all useful as diagnostic aids. Then, again, the difference between true anæmia and the anæmia of the surface, due to the congestion of the blood within the viscera, may be mentioned.

THE PRESENT STATUS OF SURGERY OF
THE KIDNEY.

Professor Obalinski delivered a lecture on this subject at the Eighth Congress of Polish Surgeons in Cracow, and basing himself upon a close examination of the literature and upon his own cases, formulated the following conclusions:—

1. The most frequent symptoms, *i.e.*, pain, enlargement and displacement of the kidney—show us which kidney is affected. When there is hæmaturia, it is only in exceptional cases that this cannot be decided, and here only an examination of the bladder with the cystoscope will prove from which ureter the blood or pus flows.

2. It is only in distinct and developed cases of affections of the kidneys that we can fully make out a diagnosis and the consequent therapeutic indications by external examination only; most frequently, especially in the beginning, we must have recourse to exposure of the kidney or even incision of the same. If there is difficulty in deciding whether the kidney or some other organ (gall-bladder, for instance) is affected, it is necessary in grave and

urgent cases to decide the question by laparotomy. Where, however, we are sure that the kidney is affected, and the only question is the severity of the affection, we should expose the kidney by an extraperitoneal incision.

3. To-day the conservative tendency prevails, and our endeavors are to preserve as much as possible such an important organ as the kidney. We only sacrifice it, therefore, when we have concluded that it contains within itself a focus that may be injurious to the remainder of the organism, or when the parenchyma has become so degenerated that its function is rendered impossible. Thus, there are only two absolute indications for nephrectomy,—namely, when in the greatly enlarged kidney a malignant growth or primary tuberculosis are positively diagnosed. The other indications will be only relative,—that is to say, will have their significance only when, after exposing the kidney or even after its incision, we have convinced ourselves of its useless function.

4. The experience so far gained by the practice of nephrectomy teaches us that, when a considerably enlarged and hard kidney can be felt before the operation, it is already or almost deprived of its natural function, and is also usually a proof of the capacity of the other kidney to perform the functions of both.

5. In view of this and the frequently demonstrated fact that even a seriously affected kidney, remaining after the extirpation of the other, may fulfill the functions of both, the requirement of an examination of the urine of each kidney separately should be considered as unnecessary and as impeding the development of surgery of the kidney. This is especially the case since Sawlik's method of catheterization of the ureters (the only one known and employed) is troublesome and unreliable, and may even be dangerous in some cases,—namely, if there are morbid microbes in the bladder, which are

transferred by the catheter into the ureters or even the renal calices.

6. When, in the kidney to be operated upon, we suspect that there is still a certain functional capacity, we should never sacrifice it, but act conservatively and resort to nephrotomy, which best facilitates the examination of the condition of the other kidney.—*Gazeta Lekarska*.

A NEW METHOD OF TREATING STRICTURE OF THE RECTUM.

Bacon, in *Mathews' Medical Quarterly*, proposes the method given below in strictures of the rectum. In January, 1895, this author published a method for stricture which consisted of a plastic operation, using the sigmoid flexure to form a new channel around the strictured portion of the canal, and claimed it was a sure means of relieving all non-malignant strictures of the rectum located above the levator ani muscle; but for that class of strictures located just above the internal sphincter ani, no plastic operation can be done that will give fecal continence afterward. These strictures have been unsuccessfully treated for ages by various methods, such as gradual dilatation with bougies, forcible division, internal and complete proctotomy, and later by means of electrolysis; they cannot be dissected out and the ends of the bowel united without leaving a circular cicatrix that will reform another stricture of the gut.

Complete proctotomy gives temporary relief by severing the stricture band, but the wound soon fills up with granulation tissue that reforms fibrous tissue, and the stricture is worse than before operation was done. Then, again, in making the complete proctotomy the sphincter muscles are severed, and often do not unite perfectly, and incontinence results. Bacon has successfully tried his present method and found that it does not interfere with the sphincter muscles, yet accomplishes permanently what complete proctotomy only does temporarily.

The wound made by a complete proctotomy—that is, when an incision is made, beginning with the rectum and cutting through the stricture band back to the coccyx and sphincter muscles—is the shape of a letter V after the ends of the stricture retract.

If we can prevent this triangle from filling up with fibrous tissue, the severed stricture band must disappear by absorption. In order to accomplish this the author produces a mucous fistula between the stricture and the coccyx, so that after the proctotomy is made the mucous tract will be at the bottom of the wound and prevent the union of the severed stricture bands.

The operation is simple and quickly done, and practically free from danger. The patient having been thoroughly anesthetized, the operator takes a blunt-pointed aneurismal needle, threaded with a very heavy silk ligature, and at a point just above the internal sphincter on the posterior rectal wall in the median line punctures the gut and carries the needle point well back into the perirectal tissue to the coccyx, and up behind the stricture above the upper limit, when the needle is forced through the rectal wall into the rectum. The ligature is now seized with a blunt hook or dressing forceps, and one end drawn down through the stricture opening, and the needle withdrawn. The two ends of the seton are now securely tied, and left hanging outside the anus. The loop of thread is left long so as to avoid severing the stricture, as it is necessary to have the seton in place for about three months to get a continuous mucous tract. There is practically no pain following the operation if the thread is tied outside of the anus and a loose loop left. Out of eighteen cases there has been no infection from the ligature or abscess, as the drainage is complete. At the end of three months the patient is again anesthetized and the seton withdrawn; a grooved director is passed through the fistulous tract behind the stricture, and the intervening stricture band severed with a

Paquelin cautery. The patient is kept in bed one week after the seton is inserted, and again one week when the stricture is divided. For two weeks after each operation the bowel is irrigated daily with solution of boracic acid.

The writer reports three failures, which he believes due to not taking in more tissue above and below the stricture band, so as to catch all the scar tissue above and below the real constriction.

CARIOUS TEETH AND TUBERCULOSIS.

Strack (*American Journal of the Medical Sciences*) has investigated the possible relation of carious teeth to tuberculosis, with valuable and suggestive results. Among 113 children with enlarged cervical glands none of the ordinarily accepted causes could be traced in forty-one per cent., and attention was called to the co-existence of carious teeth. The enlarged glands nearly always correspond in position to the affected teeth. In many cases toothache had preceded the enlargement, or the caries was evidently primary. In two cases positive evidence of the relationship of the disease was adduced. These were a boy of eighteen years and a girl of fourteen years, both healthy previously, and with no family history of tuberculosis. Enlargement of the cervical glands followed toothache. In the first case tubercle bacilli were found in the carious molar teeth; in the other a suspicious-looking granulation was found between the roots of a molar, which, on section, showed tubercles with giant cells.

FORMALIN.

For some time a need has been felt among physicians for some substance having the antiseptic powers of carbolic acid and bichloride of mercury, but which must neither be caustic nor corrosive. If the same substance could in a measure replace the clumsy heat and steam sterilizing processes, so much the better. All

this the water solution of formic aldehyde, known as formalin, will do, if present reports are true. When an alcohol is gently oxidized an aldehyde is produced. This in turn may be oxidized to an acid. Formaldehyde ($C H_2 O$) is the oxidation product of methyl alcohol, or wood spirit, and gets its name from the fact that its oxidation product is formic acid. Formaldehyde may be produced experimentally by passing the vapor of methyl alcohol, mixed with air, over a hot platinum spiral when the odor will become noticeable. It is a very volatile liquid which is quite soluble in water, and the usual commercial solution is of about 40 per cent. One of the characteristics of aldehyde is its property of uniting directly with other substances. It unites with hydrogen to form alcohol, with oxygen to form an acid, with ammonia to form aldehyde ammonia, and with other substances in the same way. Indeed, if it can find nothing else it will unite with itself to form more complex substances.

The disinfecting power of formalin is very great, and this gives it its great value. A $\frac{1}{100000}$ solution will prevent the development of bacteria while a $\frac{1}{75000}$ solution is germicidal. A 5 per cent solution gives better results than a $2\frac{1}{2}$ per cent solution of carbolic acid or a $\frac{2}{1000}$ bichloride solution. The effect of a concentrated solution on living skin is like that of tanning, and prolonged application will cause necrosis. It has no detrimental action on metal or rubber. Uses for this substance will at once suggest themselves. It may be used for cleansing the hands, the seat of an operation or infected wounds and cavities. It is an ideal substance for sterilizing instruments and keeping them sterile. In fact it may be used in every case in place of the bi-chloride.

Dr. W. S. Alexander, of Oxford, Ohio, has given formalin considerable attention, and has used it in infectious diseases with good results. In diphtheria the air of the

room was kept saturated with the vapor of formalin from a spray, and it was applied locally once or twice by means of cotton swabs. The false membrane entirely exfoliated in twelve hours. Whooping cough was treated by spraying with a 1 per cent solution. A $\frac{1}{2}$ per cent solution used as a spray, and inhalation of a 2 per cent solution worked well in catarrhal troubles and in hay fever. By using a 40 per cent solution chancreoid and chancre healed rapidly after *one* application with no bad results except the temporary pain. The doctor has tried it in many other troubles with equally good results.

Outside of the fields of medicine proper a need of a good disinfectant has long been felt. Especially has this been true of our large public libraries. Books cannot be treated with heat or with steam, so it has been practically impossible to do anything with infected books but destroy them. Happily formalin comes to the rescue here also. It vaporizes easily and has great penetrating powers. Elmer G. Horton, of the University of Pennsylvania, has experimented with formalin as a disinfectant for books, and has found that one cubic centimeter of formalin in three hundred cubic centimeters of air will perfectly sterilize a book in fifteen minutes. A longer time will not allow the admission of more air. In his experiments he used the bacilli of typhoid and of diphtheria, as being likely to occur in books. Some books containing papers smeared with cultures were placed *closed* in a bell jar of known capacity, and a measured amount of formalin was allowed to evaporate spontaneously under the jar. It was allowed to stand some time, and then the papers and books were examined with the results stated above. This would be of easy application in a library. All that would be needed is a box of known capacity and a bottle of formalin. There is no action on the books.

Formalin has been in use for several

years as a hardening and preserving agent for tissues, and its action in this line is much more satisfactory than that of alcohol. I have had an eye in a 2 per cent formalin solution since June, 1896, which was enucleated by my father on account of a tumor within the ball. The eye is now firm and hard; there is not a wrinkle or any sign of shrinkage; and it is so clear that when held in front of an electric lamp, one can look through the pupil and see the tumor *in situ*.

With the facts before him one can hardly help feeling that at last an ideal antiseptic and disinfectant has been found, and that the use of formalin in place of heat, steam, carbolic acid, and bi-chloride will in future have great use in all places where complete disinfection is desired.—Southard in *Pacific Medical Journal*.

DISCOVERY OF THE GERM OF YELLOW FEVER.

"There appears to be no doubt that Dr. Guiseppe Sanarelli has discovered the bacillus of yellow fever," says the Rome correspondent of *The British Medical Journal* (February 13). "He will publish an account of his discovery in the next number of a leading Italian hygienic publication which will be issued in the course of the next few weeks. Dr. Sanarelli is a native of Arezzo, and is now thirty-five. He studied medicine at Siena, and later experimental hygiene under Celli in Rome, Roux in Paris, and Bering in Berlin. In July, 1893, while *libero docente* in Siena, he was appointed director of the Institute of Hygiene of Montevideo. During the summer of 1896, he went to study yellow fever at the lazaretto in the Island of Flores, where he performed a large number of necropsies, and was himself stricken with the disease. When he recovered he pursued his investigations at Rio Janeiro, where the disease was very prevalent. He remained there about two months, and succeeded in discovering the

bacillus. *La Nazione*, of Florence, has published an article sent by a correspondent in Montevideo, which states that for some little time Sanarelli's modesty did not permit him to believe in his success, but in August his experiments were so clear that he was certain of the discovery of the microbe, and he then occupied himself with the preparation of the serum, in which he encountered many difficulties. Professor Sanarelli himself says that 'the microbe of yellow fever now splendidly presents itself, and is the strangest of all the microbes that are known.' His experiments are very extensive; he has vaccinated more than 2,000 animals, including rabbits, goats, sheep, monkeys and a few horses, and he did all this himself because he did not wish his discovery to leak out. The results of the treatment are definitely reassuring, and in October, 1896, he decided to announce confidentially to the President of the Republic of Uruguay the splendid results that have crowned his studies in the origin and cure of yellow fever. If this remedy be truly efficacious, Dr. Sanarelli will obtain the reward of 150,000 scudi [\$150,000] offered by the Brazilian Government for the discovery of such a remedy."

THE STERILIZATION OF SYRINGES BY

BOILING.

In a communication to the *Centralblatt für Chirurgie*, 1896, No. 27, Hofmeister claims to have solved the question of the sterilization of syringes. Although much time and thought have been expended in the effort to devise means by which syringes for surgical and bacteriological purposes could be easily and quickly rendered sterile, no satisfactory method has been proposed heretofore. Of all the new patterns of syringes that have been recommended, none has sufficient merit to displace the old form with the leather packing, and yet it has not been possible to make the latter aseptic.

The observation, by the author, of the fact that catgut could be boiled without injury after first hardening in formalin solution, led him to apply the same process to leather. It was found that common leather which was allowed to stand for twenty-four hours in a two- to four-per-cent. solution of formalin could be boiled in water without losing its softness, durability, or elasticity. Leather so prepared has been boiled for ten hours without damaging it; a slight deepening of the color was the only change to be observed. On the contrary, leather not so treated becomes, soon after boiling, so soft as to be useless, and can be torn easily; after drying, it makes a mass as hard as stone, which can be crushed into powder.

The experiments brought out the fact that the formalin leather which was boiled one hour each day for several days, and dried each time, retained its natural and useful qualities better if subjected to the formalin solution before each boiling than if macerated once only.

These experiments led him to adopt the following process for sterilizing syringes:

1. Only such syringes as consist of glass, metal and leather are suitable. The metal parts should not be fastened by putty, but should be screwed to the cylinder.
2. The piston with the leather packing is taken out and placed in ether or benzin to remove the oil.
3. It is then transferred, for twenty-four to forty-eight hours, to a two- to four-per-cent. formalin solution.
4. After rinsing thoroughly, the syringe may be put together and is ready to be boiled.
5. When ready for boiling, the air is to be driven out of the cylinder by filling with water. Glass syringes should be put in cold water and gradually heated.
6. From time to time the piston with the leather packing is to be placed again in the formalin solution. After removing the oil the leather should be examined to see that it has not shrunken. If the piston fits closely,

then it will not shrink in the subsequent steps of the process.

After two months' trial the method has proved itself to be practical.—*American Journal of the Medical Sciences.*

TREATMENT OF SYPHILODERMATA.

After a careful consideration and trial of the various methods of treating the syphilodermata, W. S. Gottheil, of New York, reached the following conclusions:—

1. In the primary stage, when only the chancre is present, no general treatment; calomel locally.

2. As soon as the secondary period sets in, as shown by the general adenopathy, angina, cephalalgia, and eruption, the internal treatment for mild cases should be $\frac{1}{4}$ to $\frac{3}{4}$ grain (0.16 or 0.50 gramme) of the protiodide of mercury three times a day, continued for three months, or until the symptoms disappear. In severer cases, with pustular eruptions, severe anginas, persistent headaches, etc., a course of six to ten intramuscular injections of 10-per-cent. calomel-albolene suspension (5 to 10 minims—0.33 to 0.66 cubic centimetre), at intervals of five to fifteen days, should be employed.

3. After completion of the course and cessation of the symptoms, apply tonics, etc., without specific treatment, for three months.

4. Then a second calomel course, as above, plus a small dose (15 grains—1 gramme) of iodide of potassium in milk after meals. This to be given whether later secondary symptoms of the skin and mucosæ appear or not.

5. Second intermission of treatment lasting three to six months, according to the presence or absence of symptoms.

6. In the second year, if tertiary lesions marked by deeper and more localized ulceration are present, give the iodide of potassium in increasing doses (60 to 600 grains—4 to 40 grammes—daily), as may be necessary. Combine with it occasional courses

of calomel injections. If no lesions appear give a mild course of both.

The best local treatment of the syphilodermata is with the mercurial plaster-mull.—*Clinical Medicine.*

TREATMENT OF FRACTURES.

In an interesting paper on this subject, G. G. Davis, in the *Annals of Surgery* for December, 1896, reaches the following conclusions: 1. Massage and passive motion are not used to the extent that they should be in the treatment of fractures. 2. Im-mobility of the fractured ends favors quick union with little deformity. 3. There are some cases in which, owing either to peculiarities of the fracture or to impaired constitution of the individual, the tendency to the formation of callus is marked; motion in these tends to the formation of exuberant callus and deformity. 4. There are others in which bony union is unduly delayed; disturbance of the fractured ends in these hinders union. 5. It is wise to wait until the fractured parts are glued together, usually eight or ten days, before attempting any except the lightest massage, and any extensive passive motion after that time should be used carefully but diligently. 6. Passive motion and massage when first attempted should be of the most gentle character, and not so violent as to disturb the relation of the broken bones. 7. Marked pain and inflammatory reaction following passive motion and massage are evidences that it has been too violent. 8. The limb should receive massage and manipulation at each inspection or change of dressing, often daily. 9. In some cases it is advisable to administer such massage as is possible without removing the splints. 10. Persistent stiffness, particularly in fractures or injuries of the wrist, is often due to a rheumatoid affection locating itself in the injured region. Massage is valuable in the treatment of such a condition. 11. Massage should be given to the parts of the limb

that lie beyond the seat of the fracture, to keep them in a normal condition. 12. Such dressings and methods of treatment should be adopted as will allow of the greatest use of massage and passive and active movements consistent with proper retention of the fragments.

PROGRESS IN HYGIENE IN THE LAST
HALF-CENTURY.

Dr. Dezarttière has prepared a memorial on the progress in hygiene in the town of Nièvre in France during the past fifty years. The streets were not paved, fifty years ago; there were no gutters, sewers or removal of refuse. Children and animals played about a central stream which was muddy and infected. A few old wells supplied the drinking water and were the receptacles for old shoes, dead animals and what not. Butchers slaughtered food animals in the streets; every household killed its own pigs and the blood and offal were left to putrefy in the sun. Closets did not exist save in very luxurious quarters. Every wall was a urinal. The houses of the peasants were dark and low with only one opening which served for door and window alike. The floor was of well-trodden earth impregnated with organic waste; men lived in contact with animals. The torch or candle served to light the dwellings, which were cold in winter, and stifling with the smoke and gases from the chimney. One walked abroad at night preceded by a torch-bearer.

To-day, the streets are paved; there are sidewalks and gutters. There are public water-works, the town is supplied with gas and electricity. The whole place is clean, wholesome, bright. Vaccination is accepted by all. Prophylactic measures against contagious diseases are sedulously enforced. Such a contrast is instructive to the present generation. Many towns are still in a hygienic condition as distressing as that of Nièvre fifty years ago.—

Dietetic and Hygienic Gazette.

CLARIFICATION OF WATER BY ALUM.

We find in the January number of *Public Health* a very interesting and practical paper on the above-named subject, from the pen of Henry Leffman, M.D., which we reproduce in part—believing that our readers will be greatly benefited by it. He says:—

“This is so useful a method of dealing with temporary turbidity in water that the proper manner of employing it should be widely known. The chemistry of its action is quite simple. The active ingredient of alum is the aluminium sulphate, and this in contact with a solution of the carbonate is broken up, aluminium hydroxide being precipitated as a flocculent or gelatinous mass. Almost all natural waters contain carbonates, generally sodium carbonate with some calcium and magnesium carbonates. Waters that do not contain these are often not satisfactorily cleared by alum.

Aluminium hydroxide has a strong affinity for many forms of organic matter, even removing them from solution. The flocculent precipitant thus entangles the great majority of the bacilli, and the whole mass is carried to the bottom of the vessel as a slimy deposit. Ordinarily about an hour is required for settlement. The water is usually beautifully clear after its subsidence, and much purer. It may be decanted, filtered, or syphoned off from its sediment.

“The quantity of alum is small, about one grain to the gallon of water. This amount should not be exceeded. For the householder the simplest plan is to have the druggist make up a quart of alum solution containing 256 grains, which is of such strength that one teaspoonful contains one grain. This solution can be added in the proportion of one teaspoonful to each gallon, and well stirred. The alum should always be added in a dissolved condition and stirred in the water. The water should not be boiled.

"As regards the question of wholesomeness, it may be said that when the alum is used in the small amount above noted, very little or none remains in the water, and, therefore, no danger exists. If used in excess it may do harm, but probably its occasional use even in excess is of little moment—but the continued use of water surcharged with alum cannot be advised. It is rather as a means of tiding over a temporary turbidity, not as a regular purifying agent, that it is suggested.—*Iowa Health Bulletin.*

TWO EASY AND DELICATE TESTS FOR ALBUMIN IN URINE.

Dr. C. Fouchlos (*Progres Medical*) recommends two new tests for albumin in urine, for which he claims utmost delicacy and absence of any possible fallacy:—

1. Add to the suspected urine a few drops of a 1 per cent solution of corrosive sublimate; in case of turbidity, add some drops of acetic acid. If the turbidity persists, it is due to the presence of albumin.

2. Take 100 c.c. of a 10 per cent solution of sulpho-cyanide of potassium, and mix with it 20 c.c. of acetic acid. Add a few drops of this mixture to the urine. If albumin is present in small quantities, an immediate turbidity will ensue; if in large quantities, a heavy white precipitate will appear.

PASTE USED BY DENTISTS TO DESTROY THE NERVE OF A TOOTH.

Menthol, }
Carbolic acid, } $\bar{a}\bar{a}$ 1 drachm.
Cocaine (pure), $\frac{1}{2}$ drachm.
Rectified spirit, 2 drachms.

Rub up together, and add—

Collodion (meth.) to make 3 ounces.—
Chemist and Druggist.

THE TIME AND TEMPERATURE REQUIRED TO DESTROY THE MICRO-ORGANISMS OF MILK.

Dr. J. Forster, of Amsterdam, has prepared the following table as the result of a large number of experiments:—

131° F.	for	4 hours.
140°	, ,	1 hour.
149°	, ,	15 minutes.
158°	, ,	10 "
176°	, ,	5 "
194°	, ,	2 "
203°	, ,	1 minute.

SPIRITS OF TURPENTINE IN THE TREATMENT OF BURNS.

M. L. M'Innis (*New York Medical Record*) says that spirits of turpentine applied to a burn of either the first, second, or third degree will almost at once relieve the pain. The burn will heal much more rapidly than by any other treatment in the author's experience. He applies the turpentine as follows:—After wrapping a thin layer of absorbent cotton over the burn, he saturates it with the common commercial turpentine, which is generally found in every house, and then bandages. Being volatile, the turpentine evaporates, and it is therefore necessary to keep the cotton moistened with it. When there are large blebs, he opens them on the second or third day. It is best to keep the spirits off the healthy skin if possible, as sometimes pain is produced by its action.

THE SURGICAL RELIEF OF OBSTRUCTION OF THE COMMON DUCT BY BILIARY CALCULI.

H. O. Marcy, of Boston, described the operation which he had been the first to do for the removal of calculus situated in the common duct. The original operation had been done on October 20, 1889, according to the following method:—The walls of the common duct were divided with scissors and their edges everted from over the calculus, the abdominal cavity having been previously shut off from the field of operation by sponges. With a fully-curved needle armed with selected tendon-suture, the divided edges of the thickened mucous membrane of the duct and gall-bladder were united by a continuous suture. Over

this the peritoneal edges were coaptated by a layer of continuous suture, and then a third layer of continuous sutures was applied, the sutures being taken parallel to the long axis of the wound, and through the peritoneum. Tension on this suture buried not it alone, but also the uninjured peritoneum. After the removal of the sponges, the peritoneum was closed with a continuous double tendon-suture. The divided muscular structures were united in a similar manner in separate layers, and the skin was coaptated by a layer of buried tendon-sutures. The wound was sealed with collodion. Convalescence was rapid. The calculus, when dried, weighed fifty-nine grains.

HYPERPYREXIA.

Mr. Newton reports a recent case, in which the patient, a girl aged 14 years, a pupil at a large school, complained during the evening of a general feeling of malaise. On awaking next morning she appeared to be very ill and was removed to the school hospital. Here the nurse was struck by her strange manner and appearance, and on taking her temperature was amazed to find that the thermometer registered 110° F. Thinking that there must be some mistake she shook the mercury down and again took the temperature in the mouth, and found that the instrument again registered 110°. Another thermometer was tried with the same result. The patient was put to

bed and a large dose of antipyrin administered; and when seen by the physician, about three quarters of an hour later, the temperature was below 101°, and the delirium had nearly passed off. The nurse had, however, kept the thermometer for the doctor to see. During the day the patient developed a slight attack of pharyngeal tonsillitis, and in forty-eight hours she was quite convalescent. About a month before this same child was attacked with the same complaint, the temperature on that occasion reaching 107°.—*Lancet*.

BEEF ESSENCE.

Take a cube of beefsteak free from fat, sear it over an alcohol lamp that has a large flame, put it in a large lemon squeezer and squeeze out all the juice; this fluid contains five to ten per cent. albuminoids, a large quantity of the salts, to which may be added a little new sweet milk and pepsin. Prepare the milk by curdling it with a few drops of dilute hydrochloric acid, then beat the eggs with an egg-beater, and add twenty to thirty grains of pure crystal pepsin. Milk and beef-juice thus prepared make an admirable invalid food. I frequently rub the yolk of a hen's egg with half its bulk of glycerin, twenty to forty or sixty drops of which given every thirty to sixty minutes is a strong food, quickly absorbed, and one that may be mixed with milk, beef essence, or both.—*Georgia Electric*.

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Editorial.

Decorations and honors have been freely distributed by Her Majesty on the occasion of the diamond jubilee. We have not yet heard of any having been bestowed upon members of the medical profession. There are a number of men in Great Britain to whom, in recognition of their great services in the alleviation of suffering and the prevention of disease, thus increasing the sum of human happiness, such honors are due. It may be that when we have the full list of those who have received Her Majesty's gracious favor we will find the names of some of these men. Speaking of the way in which the world often fails to recognise those who in the peaceful avocations of life are constantly labouring to prolong life and make it happier and more useful to society at large, we can not forbear quoting the following from the address of Dr. William W. Keen before the American Surgical Association and the Alumni Association of Jefferson Medical College, on the occasion of the unveiling of the bronze statue of the late Professor Samuel D. Gross, in Washington, D. C. "It is strange that the human race has failed so grievously to recognise publicly its great medical benefactors. Mr. Lecky, in his last remarkable book, in speaking of the rewards of genius in Great Britain, after enumerating the chief of the extraordinary and beneficent achievements of medical men in the present century, says, 'England may justly claim a foremost place in this noble work, and many of her finest intellects have been enlisted in its service. In no single instance has this kind of eminence been recognised by a peerage. It is clearly understood that another and a lower dignity is the stamp of honor which the State accords to the very highest eminence in medicine and surgery—as if to show in the clearest light how inferior in its eyes are the professions which do most to mitigate the great sum of human agony to the professions which talk and quarrel and kill.' (*Democracy and Liberty*, i. 429.) And yet Jenner almost saved England from extinction, and Simpson and Lister have done far more to mitigate the

terrors of surgery and the pangs of maternity, to save life, and to bring health and happiness to the human race than Marlborough and Wellington and Nelson have done to destroy life and bring sorrow and pain and rapine and misery.

"It is pleasant to record that England has atoned, with the opening of this year, for such long continued neglect. In making Sir Joseph Lister the first medical peer she has conferred less honor upon Lord Lister than upon herself.

"The statue of Marion Sims, not long since erected in New York, and this one of Samuel D. Gross, let us hope, are the beginning of a similar recognition of beneficent genius in our own land. Go through the broad streets of this beautiful city, and in its circles and parks and squares you will find, with singular exceptions, only the statues of statesmen and warriors—men who deserve, we all agree, their well-won honors and immortality. But, truly, 'Peace hath her victories no less renowned than those of war.' Though its heroes are not, it may be, portrayed in marble or in bronze, they are enshrined in the grateful hearts of mankind, immortal in literature, even the humblest of such toilers as the Gideon Grays and the Weelum Maclures that cheer and brighten the world.

"Yonder statue of Joseph Henry has stood alone for too many years. We have to-day unveiled its worthy companion. Both of them are memorials of men great in science, whose lives were devoted to the good of their fellow-creatures, to saving life, adding to human comfort, lessening pain, promoting knowledge, cheering the sick, and assuaging even the very pangs of the dying. We do well to honor thus in imperishable bronze the men who have won these victories of peace! To no one can the words of the blessed Master apply with greater force than to the kind surgeon whose time and thought and talents are given to humanity, and, above all, to the poor, with no payment but the grateful look of returning health and rescued life and that inward satisfaction which far surpasses all the wealth of the Orient—'Inasmuch as ye have done it unto one of the least of these, my brethren, ye have done it unto Me.'"

The plague, famine, and earthquake have been devastating India. The former continues apparently with unabated violence, although Reuter rarely refers to it. It is dying out at Bombay, but continues with marked severity in the Cutch district, north of that city. It seems to be traveling westward, as it has appeared at Jeddah on the eastern

shore of the Red Sea. The important problem is to keep it out of Europe. Quarantine against infected ports has been practiced in all of the principal sea-ports of Europe. The great danger is that as the epidemic continues vigilance will relax. "Familiarity breeds contempt," and more frequently carelessness. One source of danger is the conveyance of this disease from infected ports by means of ship's rats. The rat is as susceptible to this difficulty as is the Guinea pig to tuberculosis or the mouse to mouse-septicæmia. It is very probable that the infection is largely carried by rats and mice. Being constant inhabitants of dark and filthy holes and water drains, they come out at night and help themselves to articles of food that have been left within their reach, running about over tables and cooking utensils, spreading infection wherever they tread. Direct contagion from person to person, in this disease, is highly improbable. Aoyama, we believe it is, who claims that it is taken into the system only by the digestive tract or by a solution of continuity in some of the exposed tissues of the body. Therefore if the respiratory mucous membrane is perfect, infection can not take place by inhalation. Overcrowding, foul air, *sewage-soaked soil*, and defective drainage appear to most greatly favor the spread of the disease. Better attention to sanitation, improved drainage, the making it impossible for vermin to exist about a house; these things will go far toward preventing the spread of infection.

It is a popular fallacy to suppose that this disease, like yellow fever, is peculiar to tropical latitudes and "heated terms." This is a mistake. While its natural habitat is more or less one with Asiatic cholera, it is not all confined to warm climates or warm seasons. It has several times been known as far north as Norway. In this connection the following quotation from Hecker may be of interest: "The inhabitants of Iceland and Greenland found in the coldness of their inhospitable climate no protection against the southern enemy who had penetrated to them from happier countries. The plague caused great havoc among them. Nature made no allowance for their constant warfare with the elements and the parsimony with which she meted out to them the enjoyments of life. In Denmark and Norway, however, people were so occupied with their own misery that the accustomed voyages to Greenland ceased. Towering icebergs formed at the same time on the coast of east Greenland, in consequence of the general concussion of the earth's organism, and no mortal from that time forward has ever seen that shore or its inhabitants." Climate and season seem to have no causal relationship. Epidemics have followed prolonged drouths, and have prevailed during

rainy seasons. The epidemic at Hongkong in 1894 appeared after a prolonged season of dry weather. Rain was anxiously looked for—probably prayed for. It was said, All will be well when the rain comes. At last the rain did come, and with it the disease seemed to be refreshed and the number of deaths was multiplied.

The discovery of the plague bacillus by Kitasato and Yersin in 1894 has not only cleared up the etiology and pathology of this disease, but has made possible the line of experimentation which has resulted in the adoption of serum therapy and protective inoculation in its treatment and prevention. This bacillus, which is a short, rounded one, is destroyed by drying, and very rapidly so by exposure to direct sunlight. Boiling water or steam destroys it very quickly, while one-per-cent carbolic acid will kill it in an hour. A good culture medium for the bacillus is a two-per-cent alkaline peptone bouillon, to which two-per-cent of gelatine has been added. The antitoxic serum is best produced in horses and rabbits. This serum-therapy as demonstrated by Yersin is highly efficacious. Of the 26 cases at Canton (3) and Amoy (23) only two died, and these were injected on the fifth day of the disease, and were desperate from the outset. In India, Yersin and Haffkine have been inoculating large numbers with their respective curative and prophylactic serums. No extended report has yet been published, but up to March 17th Haffkine had inoculated 2,790 persons with his serum. It is said that none of those inoculated while free of plague have died of the disease and but few have been attacked, and that all attacked subsequent to inoculation except three have recovered. Dr. Yersin is reported to be very successful with his curative serum, failure occurring only in those who were moribund when inoculated. The doctors sent to India by the Austrian government have reported to the Academy of Sciences at Vienna that neither Yersin's nor Haffkine's serum has been successful in the treatment of bubonic plague. This seems to be at variance with all the reports from other sources. It has been suggested that jealousy, or diversity of opinion in regard to the definition of what constitutes success, may be accountable for this report.

The following prescription, which if it did no good, would certainly do no harm, is taken from a seventeenth century book entitled, *A Treatise of the Pestilence*, by Thomas Phayer, and will be of interest from the point of view of medical history:—

“A very good preseruatiue for the common people, ready at all times and of small coste : Take an ounce of leaves of rue, half an ounce of good figges, one ounce of Jenuper berries, two ounces of walnuttess

piked, iiii ounces of vinegar, and a good quantitie of saffron ; stampe all the foresaide thynges together and reserue them in an earthen cuppe or a glasse faste stopped that no ayre yssue, whereof yf ye receyue in the mornynge upon a knifes poynte, the quantity of a beane or more ye shalbe sure by the grace of God not to be infected in four and twenty hours after."

That which strikes one most, upon perusal of Dr. Neal's article in this issue of the Journal, is that in the many decades medical missionary work has been established in China, so little has been done in the way of medical education. Aside from the work done by our senior missionary and his colleagues, the result is almost nil. A moment's reflection will explain why this is so. The medical missionary has always had his hands more than full with the clinical work he has had to attend to, and often, aside from his medical duties, he holds positions of responsibility in the mission with which he is connected. So that the training of medical students has been with him quite a secondary matter, has been rendered necessary by his need for medical assistants in his work, his teaching has been done at such times as he could snatch from his multifarious duties, and has therefore been of the most desultory and superficial character. Small wonder then that the results have been meager and unsatisfactory. The only wonder is that so much has been accomplished as there has. One of our number, whose students rank up with the best yet trained in China, will serve as an illustration of how difficult it is for the missionary physician to find time for this work. He is Customs and community physician, has care of the members of his own mission for the province in which he resides, has charge of a large hospital and dispensary, and without neglecting these must endeavor to do justice to his students. The medical missionary, *pur et simple*, can not, for many reasons, carry on this work successfully. The chief of these is that most medical missionaries feel the urgent call of duty in other directions; either to the direct relief of suffering, or to that of more directly preaching the Gospel. Opinions differ as to the value of medical teaching as *missionary* work. If done with any great degree of efficiency the work is exacting as to time, and few feel the call of duty in this direction to such a degree as to warrant them in devoting the requisite amount of time and attention to the subject. This is a work for the broader sympathies of the whole medical profession. Our profession has always been marked by its great sympathy with human suffering, and with intense interest in its

alleviation. Surely no wider field of human philanthropy can be found than that of giving rational medicine to the many miserable millions of China. Irrespective of creed or no creed, this is a work that should appeal to all. Some will give themselves entirely to this work; all should give it their heartiest sympathy and co-öperation.

There is some difference of opinion as to the best and most practicable *method* of giving medical instruction. Without doubt a medical school should be a *school*, in which genuine class and laboratory work is carried on; and should *not* consist in a number of boys, with little or no knowledge of elementary principles, wandering more or less aimlessly about hospital wards and dispensaries, picking up here and there a few "shot-gun" formulæ and a smattering of medical and surgical lore. If a thorough knowledge of the elementary principles of medical science is necessary for the medical student of the West, it is doubly so for the student in China. The apprenticeship system is the one in use with Chinese doctors in training their pupils, and has been largely adopted by medical missionaries. But with the great advances in medical science, and with the improved methods of medical instruction, this system is no longer practicable. School methods must therefore be adopted. The great difficulty in carrying out this latter plan is the lack of outfit and teaching force. The outfit will come, if the work is well started and an appeal is made in the proper quarter. For the teaching, we cannot depend upon the foreigner. He is too expensive and hard to get. Natives must be trained for the work of tutors and demonstrators.

In this connection, and at the request of two members of the Association, one in south and one in north China, we give an outline of the plan adopted by the Nanking University School of Medicine, which plan has received the approval of the mission board at home. In the establishing of this school we have largely been guided by the principles laid down in two papers, one published in this Journal, (Vol. VIII, p. 91), and one in the *Chinese Recorder*, (October, 1896). The course covers four years, two and a half of which are devoted to class and laboratory work, and one and a half to clinical work in hospital and dispensary. To this course, an entrance examination is required in the following subjects:—Chinese Language and Composition; Arithmetic; Political and Physical Geography; Experimental Physics; General Chemistry; Elements of Biology; Rudiments of English Language. Those who are not prepared in these subjects are required to take them in a preliminary year in the Academical Department. The following outlines the course of instruction for the four years:—

- 1st Year.—Anatomy : Bones, Joints, Muscles, and Blood Vessels.
 Histology : Lectures and Laboratory.
 Chemistry : Analysis.
 Physiology : Lectures and Laboratory.
 Bacteriology : „ „
- 2nd Year.—Anatomy : complete, including Regional Anatomy.
 Medical Chemistry, including Urinalysis and Toxicology.
 Materia Medica.
 Therapeutics.
 Pathology : Lectures and Laboratory.
- 3rd Year.—Obstetrics : Lectures.
 Physical Diagnosis.
 Medicine : Lectures.
 Surgery : „ „
 Minor Surgery and Surgical Dressings.
- 4th Year.—Clinical Medicine.
 „ Surgery.
 „ Obstetrics.
 Operative Surgery.
 Ambulance Drill. (Elective.)

Students pay all their own expenses, including breakage on apparatus, and tuition as follows : Preliminary year, \$12; First and Second Years, \$25 per year; Third and Fourth Years, \$20 per year. The plan is working very well. The students, including those now in the course and those preparing for it, number eleven, with the prospect of a large increase next year.

The attention of the members of the Association is called to the lists at the close of this number. It is very desirable that a correct list of the members of the Association be prepared at the present time. We can not find out whether any register of members was ever kept. Nothing appears upon the subject in the books in the Secretary's hands. Of course, a list of the names of those who were then members was published in 1890, and those who have been elected since were officially announced in the JOURNAL from time to time. But there have been so many changes, and the names have been written on no definite plan, so that a list prepared from these sources would be very unsatisfactory. Let each member see to it, not only that the facts in his own case, but also in that of the members of his mission, his colleagues in the city in

which he resides, or of any other case with which he may be familiar, are sent to the Secretary at once. Do not be afraid of overstocking that officer with information.

The Editor particularly desires that the proper qualification shall be attached to each name. In the March number of the JOURNAL one contributor's qualification was wholly omitted, mainly because no information on that point was at hand. The omission was due primarily to the Doctor's modesty in not attaching his proper qualification to the manuscript, and secondarily to the fact that when both copy and proof were read the list was not at hand to refer to for the proper title, and afterwards it was by an oversight entirely omitted. The Editor will consider it a great favor if each contributor will write the proper qualification after his name in the proper place on the manuscript.



Evangelistic.

We extract the following from the report of the Executive Committee of the Medical Missionary Association of Great Britain :—

“The Church has been slow to realise her own possessions in her Lord, and it is not wonderful if she has been somewhat laggard in inviting others to share in them. Happily this time of a narrower vision is passing away, and she is learning to present her Master to the world in more of the fulness which He claims at her hands. The medical element in missions is essential to this fulness.

“Medical missions are progressing. The Churches are recognising their necessity and developing them in larger numbers and with fuller equipment. In January, 1890, when we first began to issue a list of medical missionaries holding British degrees or diplomas, there were 125 such missionaries. This year there are 239. This is good, but there is room for a vast advance. The rate of increase is indeed largely dependent on the enthusiasm of our Christian women. It was in 1880 that the late Dr. Fanny Butler went out to India as the first representative of women’s medical missions from this country. Now there are fifty-four such missionaries, and last year they added eighteen to their list as against sixteen added by the men. This is most certainly not as it should be. However much we prize the noble work wrought by our sisters, it is a shame to our profession that they should have to point the way in the matter of loyalty and devotion to Christ.”

Mr. Robert E. Speer, one of the Corresponding Secretaries of the Board of Missions of the American Presbyterian Church, who is now visiting their work in China, writing in regard to their work in Teheran, says :—

“Medical and educational methods of evangelization are sometimes spoken of as indirect methods of missionary work, while the immediate oral presentation of the Gospel is regarded as the direct method. Medical and educational work may be so carried on as to give force to this distinction, and in times of financial limitation they may be provided for at the expense of aggressive widespread preaching, arriving at the immediate conversion of souls without the subsidiary aims and aids of hospital, dispensary or school. On the other hand, medical and educational work may be made more positively and fruitfully evangelistic than much oral proclamation of the Gospel. In a good station the supreme end of each department will be direct evangelization. General beneficence, enlightenment or enlarged intelligence will not be satisfactory fruits if they fall short of positive evangelization of the most

wide-reaching kind. The Teheran station has the right ends in view, at least. As Mr. Ward expressed it in some long discussions we had together at a station, over the aims of our work, our plan of action, our limitations and the conditions of the specific field assigned to Teheran, "Evangelistic preaching, evangelistic teaching, and evangelistic healing, are the methods we attempt to pursue."

"Some time ago while in temporary charge of the hospital at Swatow, so well known in connection with the work of Drs. Gauld and Lyall, I had as careful a search as feasible made for the former in-patients who had applied for baptism while under treatment in the wards. The recent appointment of a colporteur and Bible reader who was to devote his whole time to the patients made this extensive visitation possible. He was accompanied in almost all of his visitations by the preacher stationed at the chapel nearest the district visited. The result was distinctly encouraging.

"It is a common experience in asking the preachers (who are quite alive to the value of medical missionary work) to visit ex-patients, for them to say that while people are in the hospital they are willing enough to worship, but it is a very different matter when they are at home again, and one feels somewhat depressed at the apparent meagreness of definite results. Certainly I was not prepared for such a good showing as the tabulated results. From 1888 to 1893 inclusive 425 in-patients were enrolled as applicants for baptism, some of whom had already applied in previous years. An attempt was made to trace 259 of these, with the following results:—

22 had died.

85 had received baptism.

68 could not be found.

75 were still on probation (not giving entire satisfaction.)

17 were unsatisfactory or afraid.

40 had apparently quite gone back.

"Eighty-five baptisms represents one in five of the applicants, and it must be kept in mind that perhaps many of those on probation may yet be received, and that *out-patients* are not included.

"This is merely a bald record of figures. It takes no account of secret believers, of the parents, husbands, wives, children, friends of these inquirers who have been led by them to know God, of the thousands who in these inquirers who have been led by them to know God, of the thousands who in these same six years have had their eyes opened to the folly of their superstitions.

"It is not an attempt to estimate spiritual work statistically. But it is a partial record of the after history of hospital inquirers, and as such is devoid of neither interest nor encouragement."

PHILIP B. COUSLAND.

The following from a private letter to the Editor is published with Dr. Kilborn's consent :—

"Regular medical work was begun in this city first after the riots by Dr. Gifford Kilborn. Her hospital for women and children was opened November 23rd, 1896. Patients are seen every Monday, Wednesday, and Friday,—besides those who are visited at their homes. Both classes have increased rapidly in number since Chinese New Year; from 40 to 50 is the usual attendance just now.

"Our hospital for general work, but more especially for men, will open Monday, 29th instant. Everything was destroyed in the riots, so all our buildings are new now; they are nearly finished, except parts of the wards. We can carry on dispensary work now, and in-patients in a week or two.

"Dr. Smith, just arrived in January from Canada, is deep in the language. He will be ready for the medical work by and by.

"Dr. Canright, of the M. E. Mission here, will begin his medical work soon.

"The C. I. M. have no doctor in Chen-tu at present. Dr. Parry used to be here, you will remember.

"Every department of mission work seems encouraging in this city at the present time. Preaching services are remarkably well attended, both those on Sunday, and the street-chapel services. Congregations of 200 are ordinary, while those of 350 and even 400 are not uncommon. The people listen attentively, and regular attendants on all services are growing more numerous. Numbers are putting their names down as enquirers, and we believe a great ingathering of souls will mark the present year."

Chen-tu, March 26, 1897.

O. L. KILBORN.

The following extracts from an article written for the *Gospel in All Lands*, by Rev. Moses C. White, M.D., one of the pioneer missionaries, and pioneer medical missionary of the Methodist Episcopal Church to China, will be read with interest in connection with Dr. Whitney's article in this number of the Journal. Dr. White's health did not permit him to remain long on the field, but he has always manifested the greatest interest in medical missionary work, and particularly in medical education among the Chinese. He has for many years held the position of Professor of Pathology in the Medical Department of Yale College :—

"On April 13, 1847, the first missionaries of the Methodist Episcopal Church to China, Rev. Judson D. Collins and Rev. Moses C. White and wife, bade farewell to friends in New York, and at 5 p.m. went on board the steamer *Oregon* en route for Boston. As the steamer sailed out East River they went on deck and sang—

“ Yes, my native land, I love thee ;
 Far away ye billows bear me.
 Pleased, I leave thee ;
 Native land, farewell, farewell.”

They arrived in Boston on the fourteenth, and at 11 a.m., April 15, went aboard the ship *Heber*, Captain Patterson commanding. With them as fellow-passengers were Mr. and Mrs. Doty and Mr. Talmadge, missionaries of the American Board to China.

At 11 : 30 a.m. Bishop Janes gave out the hymn:—

“ Ye Christian heralds, go proclaim
 Salvation in Immanuel's name ;
 To distant climes the tidings bear,
 And plant the Rose of Sharon there.”

After singing the hymn the doxology was sung, and Rev. Dr. Anderson, Secretary of the American Board, pronounced the benediction. Good-byes were said. The ship started on its way, and at 4 : 30 p.m. land disappeared.

Not a ship was spoken on the way, and but few sails were seen. A heavy storm of wind was encountered halfway between Rio Janeiro and the Cape of Good Hope. The ship stopped a few hours at Anger in the Strait of Sunda on July 20, arrived at Macao August 5, Canton August 7, one hundred and fourteen days from Boston. They left Canton in a Chinese sail boat August 13, and arrived at Hongkong the next day. They sailed from Hong-kong August 21 in a Portuguese *lorcha* or schooner of about seventy tons burden, arriving at Amoy August 28, and the Foochow anchorage September 6, 1847.

In the special instructions to our first missionaries was the following :—

It is expected that each member of the mission will strive to master the language at the earliest period, and will omit neither opportunity nor effort for securing that important end. Preaching the Gospel of Jesus Christ to few or many, as God may give you occasion, you will consider your one great work. As subordinate and auxiliary to this, other things may require your attention ; for example, healing the sick and the establishment of schools. Brother White, having given some attention to the study of medicine, is instructed to spend so much of his time distributing medicines and healing the sick as may be conducive to the best interests of the mission.

In February, 1848, I rented and opened a dispensary adjoining my house at Tong-chiu and continued to labor there as health and other duties would permit till the arrival of Dr. Wiley in 1851, when I relinquished the medical work to him as soon as he learned enough of the language to take my place. This gave me time for direct missionary labor. In all my medical work, in my own house, in the dispensary, and in the houses of the Chinese, I talked about Jesus and distributed Christian books.

Calls for medical work were plentiful. In one night I had three calls to treat persons who were poisoned by opium. Hundreds were treated, and the great majority were rescued from death. I often went alone with entire strangers into unfrequented parts of the city to rescue those who had taken opium to end their existence. People would sometimes cry out, “ Kill the foreign devil,” but those who had called on me to go with them would cry, “ Hush ! He goes to save life.” To the credit of the people be it said, I was never molested, and generally succeeded in saving the life of the patient.

Many a person in high life opened his doors to the foreign doctor, and received his tracts and portions of Scripture. Once a crowd of men high in rank knelt as I prayed to God to save a beloved daughter when no human skill seemed to avail. The missionary's wife went [with her husband when making medical visits to women of rank. The son of a high officer at Peking was cured of insanity by this first medical missionary at Foochow.

Our mission desired very much to secure a foothold inside the walls of Foochow. Once I presented a petition to the Ming Kaing (Mayer) of the Min District, asking permission to rent a room for a dispensary within his portion of the city. He received me politely, took my petition, and after a few days answered in writing that he highly appreciated my good will, and that my skill and charity were known far and wide; it was therefore unnecessary for me to take the trouble to keep a public room inside the city as those who needed my services could easily repair to my residence at the middle island in the southern suburb.

"Why do you English and American people force our country to admit opium?" was often asked as we tried to tell them that our religion was better than the worship of idols. "Stop the opium trade," said the people, "and then we will be glad to hear about your religion." Sad, indeed, is the heart of the missionary as he hears the Chinese deplore the introduction of opium in a way that has baffled the most sincere and earnest efforts of the Chinese government to exclude.

On January 29, 1849, I was called to see a woman dying with consumption in one of the finest houses I ever visited in China. The father-in-law, a man of rank, called the male members of his family and friends—some twenty persons, richly dressed in silks and satins—to hear me tell of the Saviour of sinners. He gave me permission to talk and pray, which I did with a throbbing and overflowing heart. The men listened with seriousness, and all knelt while I prayed—partly in Chinese and partly in English, as my knowledge of Chinese was then very limited. Afterward I sent them some Christian books, which I doubt not were carefully read. I believe the seed was not sown in vain.

My own missionary work, outside of my dispensary, was to a great extent that of a colporteur street preacher. My heart was full as I went from place to place distributing Christian books and telling the story of Jesus and His love. In the streets, in the temples, in stores, and in public places, I talked about the Father in heaven and the Saviour of sinners.

In a great open court, 400 feet wide and 1,000 feet long, in front of the Provincial Treasury, was a large pavilion, through which was a public thoroughfare. Here, on one side of the way, on a stone, about eighteen inches high, I frequently stood to speak to the people. At first I was insulted, hooted at, and bits of tile and pieces of fruit were thrown at me, and one man came and blew tobacco smoke in my face. Week after week, for two years, I went to that station with a good degree of regularity. Very soon all molestation was stopped. The man who had blown the smoke in my face took pains to keep order and rebuke any who offered to interrupt me. Often I would talk till weary, and then go to the tea tables on the opposite side of the pavilion for refreshment. There the old men gathered around, and told the young men and boys to stand aside and keep quiet while they talked with the foreigner about Western people and their religion, generally bringing up the subject of the opium trade.

One day, as I was pressing my way through a dense crowd to reach this station, an old man, with flowing beard as white as wool, took me by the arm, and said: "Are you going yonder to talk the Jesus doctrine to-day? I have heard you speak there. That is a good doctrine." My heart was melted at such a salutation. Many a hearty welcome and encouraging word did I receive from the Chinese. I do not remember ever feeling a doubt or fear as to the result of my labors. I expect to meet in heaven many to whom I told, as best I could, the story of the cross and the love of my Saviour.

In February, 1850, I had typhoid fever, and was brought to the very gates of death, but, through the care of kind friends and the aid of an English army surgeon from India, I was restored to health after being seven months an invalid. During the acute stage of

the fever I, like Brother Collins, longed for the mountain water. I remember saying, "I will have it." I lived alone with my two Chinese servants and my teacher. I sent for a coolie, and asked him to take two porcelain jars, holding nearly two gallons each, and go to the mountain and bring them filled with water. These two jars of water lasted me two weeks. As a result of my experience I always remember to give patients with fever good, sparkling water.

Other missionaries have been sick and have returned home. Some have died. Better houses, better food, and other improved surroundings make Foochow to compare favorably with places of the same latitude in almost any part of the world. The drinking water is poor. The water from the rivers of China is generally contaminated with sewage and rendered more or less unhealthy from the nature of the soil and the rocks through which it percolates. I am satisfied that drinking tea is more conducive to health on the coast of China than the use of water from rivers and wells.

Owing to the great difficulty of procuring suitable houses on account of the opposition of the people, it was decided to rent a house in a desirable locality and take possession quickly, hoping that the people would acquiesce in a fact accomplished.

By quiet negotiation we obtained a lease of a house at Quantow, halfway between the river and the walled city. With what we could carry in our satchels Mrs. White and myself went to the house, stepped in, and shut the doors. Then a message was sent back to the other brethren, who forwarded quickly our beds, bedding, cooking utensils, etc., and the removal was effected in one afternoon. The village constable appeared, and, learning the condition of affairs, asked if we would subscribe something to pay the village watchman. This we were glad to do, and, the bargain being made, that official was bound to see that we were not molested.

The new compound was about 40 feet wide and 150 feet deep, and surrounded with a high wall; but our sleeping room had no light save from a few bull's-eye lights in the roof of tiling over our heads. We expected to make some repairs, and hoped to build a small chapel and school-room in the part near the street, but when the wet weather set in Mrs. White was in such poor health that Dr. Wiley said she could not possibly live if she remained at Foochow. My own health had also been much impaired by exposure.

With much reluctance we started for America the last of December, 1852. We sailed from Canton for New York on the ship *N. B. Palmer*, and reached New York in August 1853.

SURGERY UNDER DIFFICULTIES.

Dr. J. Hunter Wells, Pyeng Yang, Korea, in the last year, cut off an arm in the dining-room, performed an operation for cataract of the eye in the bedroom, cut off a leg in the shed, made use of the kitchen for many minor operations, and had patients lying all over the neighborhood in every available shed or room. Notwithstanding the lack of accommodations, he treated some 4,000 patients, contributing much to the advancement of the growing work of that station. Friends living in Indiana have provided the funds, and a new dispensary and hospital on a small scale have just been completed.

The American Tract Society publishes in a little leaflet the following sweet stanzas :—

HE CARETH.

What can it mean? Is it aught to him
That the nights are long and the days are dim?
Can he be touched by the griefs I bear,
Which sadden the heart and whiten the hair?
Around his throne are eternal calms,
And strong, glad music of happy psalms,
And bliss unruffled by any strife.
How can he care for my little life?

And yet I want him to care for me
While I live in this world where the sorrows be.
When the lights die down from the path I take,
When strength is feeble and friends forsake,
When love and music, that once did bless,
Have left me to silence and loneliness,
And my life-song changes to sobbing prayers,
Then my heart cries out for a God who cares.

When shadows hang o'er me the whole day long
And my spirit is bowed with shame and wrong;
When I am not good, and the deeper shade
Of conscious sin makes my heart afraid,
And the busy world has too much to do
To stay in its course to help me through,
And I long for a Saviour—can it be
That the God of the universe cares for me?

Oh, wonderful story of deathless love!
Each child is dear to that heart above.
He fights for me when I cannot fight,
He comforts me in the gloom of night,
He lifts the burden, for he is strong,
He stills the sigh and awakens the song;
The sorrow that bowed me down he bears,
And loves and pardons *because he cares.*

Let all who are sad take heart again;
We are not alone in our hours of pain;
Our Father stoops from his throne above
To soothe and quiet us with his love.
He leaves us not when the storm is high
And we have safety, for he is nigh.
Can it be trouble which he doth share?
Oh, rest in peace, for the Lord *does care.*

VALUE OF MEDICAL WORK.

An incident illustrating the value of the medical arm of the missionary service is given by Dr. Waples, of Kalgan, North China, who reports the case of an intelligent man who, by a comparatively simple surgical operation, was relieved from a most distressing difficulty in his throat, which rendered his speech almost unintelligible. Accompanying the patient's cure was a glad reception of the Gospel, and the healed man went to his own village praising the doctrine which healed both body and soul. A few weeks later, Dr. Waples visited this man's village, where he was very warmly received by all the people, and already there are three families in the place which have accepted the Christian faith.—*The Missionary Herald.*

We are sorry to have to record that the Queen of Madagascar has, under the order of the French General Gallieni, served upon the joint committee of the London Missionary Society and the Society of Friends an order to vacate the Antananarivo Hospital, a cut of which appeared in the March number of the JOURNAL. Communications on the subject have been made by the committees to Lord Salisbury and to the French government. No reason for the eviction has been made public.

In Memoriam.

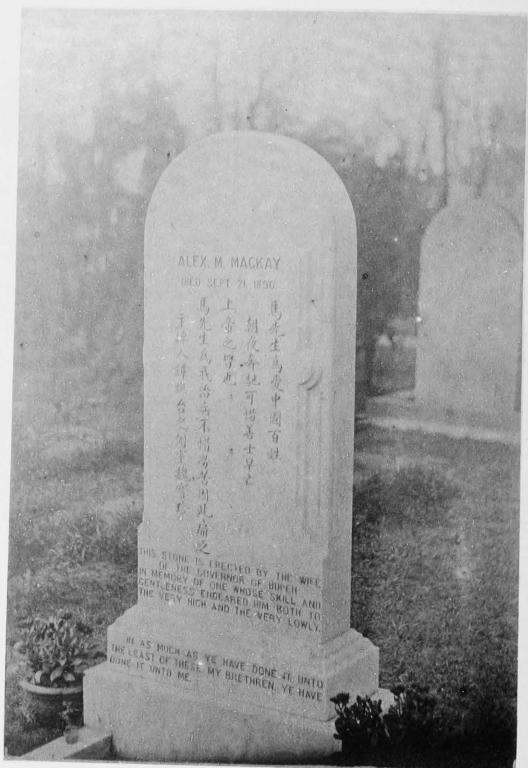
It is some six years ago that I was introduced to Alex. Mackay, a sturdy little Scotchman with a smiling face and a warm grip of the hand. I little thought then what a great influence he was to have in the city of Wuchang, or how much we should work together in the years to come.

A quiet little man, with a fund of humour and a curious knack of humming to himself whilst at work, you did not all at once learn to know Mackay. He hailed from Caithness, in the north of Scotland, where, in Halkirk he spent his youth. Bereft of his father when he was but three years old he was brought up by a godly mother, with several brothers and sisters, on plain fare and plenty of fresh air. He seems to have been (as are not all true Scots?) of a serious turn of mind, and "turned preacher before he could read"—though I warrant his conscience was easy to him on many an innocent prank. He worked his way up, as many a Scotch lad before him has done, and his first prize was "a History of China." This we are told laid hold on his imagination and doubtless formed a factor in his after life. He chose medicine as his profession and graduated with credit at Edinburgh. Here he came under the influence of Studd and Prof. Drummond, and was one of the converts in that remarkable wave of holy influence which swept over the University at that time. Thence he went to London for post-graduate work, and the Rev. Reid Howett, who knew him well, tells "of his rare influence on the young." This influence he never lost, but was always a favourite with the boys and girls and young men, even among the Chinese. Later on he gained further experience as a ship's doctor, and then joined the L. M. S. in Hankow. After working for some time in connexion with them, first at Hankow and later at Wuchang, he started in private practice for himself in Wuchang. He still considered himself as a missionary, though unattached, and there was no possibility of doubt in the minds of either natives or foreigners as to his aims in life. He voluntarily conducted the dispensary of the Wesleyan Mission in that city and did a large benevolent work himself amongst the poor. As private medical attendant to the Fu Tai and to the Viceroy's Secretary, as well as to many other officials, he got an entrance into many influential families—an influence he always used for the glory of God. A friend in Wuchang writes: "There was no one in Wuchang so well known and so universally beloved as Dr. Mackay. High mandarins, impecunious and expectant officials, government employés, missionaries, shop-keepers, soldiers, and the very poorest of the poor were amongst his patients, and more numerous than his patients were his friends, both Chinese and foreign." "One most noticeable feature of Dr.

Mackay's work was the intimacy that existed between him and some of the highest officials in the city. It was not only that he was their doctor, but he was their friend, always welcome." Wherever he went the Gospel went. One who worked with him says he made it a point to tell of Jesus in every home he went, and through him many a one in high places heard the truth, and more than one found the light. He was one of the most humble, gentle and unselfish of men. Said a mandarin's son of him, "He was always willing to listen to what we have to say, and that is what is necessary in a doctor. It is very necessary that a doctor should be gentle and not brusque." He was not only the private physician of the governor of the province, but the friend of the family. "In the governor's Yamên hangs a large portrait of 'the beloved physician,' and all who go into that room are taken to look at it and are told of many loving words and deeds of the one so much honoured."

Unselfish, unsparing of himself, and overworked he fell an easy victim to cholera in the epidemic of last year. All through the epidemic he had been hard at work amongst both foreigners and natives, and saved many a life. "Only a few days before he was taken ill one of his patients was seized with the terrible disease. Dr. Mackay was with her nearly all day until danger was over, not only doing the work of a doctor but that of a nurse as well. He was seeing patients until late on Sunday, September 20th, and was seized with his fatal illness about 2 o'clock on Monday morning—knowing there was no doctor in the city he did not send to any one to come to him; his native assistants and the servants got him such medicines as were in the house, and it was not until 9 o'clock in the morning that any one knew of it and came to nurse him. Dr. Gillison, of the L. M. S., Hankow, was at once sent for, but arrived too late to save the life of his old colleague and friend." For him there was no rebellion to the call, it was all right; he was glad that Dr. Davenport would soon be here, and that Wuchang would not be left. Quietly and calmly he gave his last directions, bore his simple testimony to his readiness to go to his Master and fell asleep early on Monday afternoon, having been ill only 12 short hours, during the most painful of which his unselfish thought for others had left him all alone. Part of his last message to his mother was, "Tell her I'm glad I came to China."

So passed away, all too soon it seems to us, one of the most loveable and loved workers in Central China, worthy to be placed by the side of such men as Roberts and Mackenzie. It has seemed right to specially refer to him, because, though comparatively unknown, he was, in every respect, an ideal medical missionary. In the first place he was an earnest evangelist, loving the Lord with all his heart and telling out the good tidings everywhere. In the next he was an earnest and capable doctor who had no sympathy with slipshod work. Lastly his Christian love was shown in his wonderful patience



ALEX. M. MACKAY

DIED SEPT. 21, 1890.

馬先生為愛中國百姓
朝夜奔馳可憐善士早亡
上帝之口也
馬先生為我治病不惜勞苦因此崩之
于海人憐其台之創其魏有焉

THIS STONE IS ERECTED BY THE WIFE
OF THE GOVERNOR OF BRITISH
IN MEMORY OF ONE WHOSE SKILL AND
GENTLENESS ENDARED HIM BOTH TO
THE VERY HIGH AND THE VERY LOWLY.

WE AS MUCH AS YE HAVE DONE IT, UNTO
THE LEAST OF THESE MY BRETHREN, YE HAVE
DONE IT UNTO ME.

DR. MACKAY'S TOMB.

and gentleness, as one writes of him—his sympathy and kindness “got to be connected with his love to God and God’s love to them, and so led the more thoughtful ones to read the Bible and perhaps to pray to and believe in the Heavenly Father.”

His simple child-like faith was shown in the way he cut himself loose from any recognised society that he might more fully carry on work amongst the upper classes *in their own homes*, in his own way, trusting in the Lord to supply his wants. Into those homes he got as no missionary doctor before had done, amongst rich and poor as a loved and trusted friend, and there he carried the Gospel of love.

Mackay’s death is one of those permissive acts of God which to us appear so strange. A unique man, doing a unique work, in a unique sphere! Yet taken away just when he seemed most needed! It is only *seemingly* that the enemy has gained an advantage, and we wait with faith to see how the Lord will overrule this loss to the glory of God! The seed has fallen into the ground and died, and it *must* bear fruit. In our little Hankow cemetery stands a beautiful marble tomb, erected by the wife of the governor, a photograph of which accompanies this memoir. But Alex. Mackay himself lives and will live in the hearts of all classes of the Chinese in Wuchang, and only the day will declare how nobly and faithfully he served his Master. “Go thou, and do likewise.”

S. R. H.

IN MEMORIAM*

A. M. MACKAY.

Æt. 32.

1. “Go home content, the evening falls,
Day’s tired sinews are unbent;
No more the thrush or linnet calls,
The twilight fades, go home content.”
2. “Father, the field is but half-turned
And yet the Spring is well-nigh spent.”
“My son, the hour of rest is earned,
The day’s work done, go home content.”
3. “Father, the field is rough and bare,
Its sullen surface scarcely rent
I’ll plough but one more furrow there.”
“Not now, my son, go home content.”
4. “Father, the wheat will never root,
The sun has sunk the hills anent,
My weary labour will not boot,
With work half done, how be content?”

* [The writer of these lines was also called to “go home content” on the 27th of June, just before this memoir was sent to press.—ED.]

5. "My child, the sun hath seen thee toil
With sturdy back and brown arms bent,
Tho' other hands should till this soil
Thy work is done, go home content."
-

6. "LORD, I have worked a little day
On the long task that Thou hast sent ;
The evening falls, my homeward way
I go to Thee ; I am content."

L. F. W.

Wuchang.

In the March number of the JOURNAL we sent the notice of Dr. J. J. Gregory's death, which occurred at Maquoketa, Iowa, U. S. A., October 16th, 1896. We have been waiting, hoping for more data in order to write more fully, but as none have been received, we will add a few words from personal acquaintance.

Dr. Gregory was first appointed to Peking, by the Methodist Board, in 1889, but before he reached the field was transferred to Foochow. He taught for a while in the Anglo-Chinese college. But being very anxious to have a hospital in connection with his work, and it not being convenient to have one at Foochow, it was finally decided that he go to Kucheng, an interior station about 100 miles from Foochow. There he built and equipped one of the best hospitals and dispensaries in China. The Society also sent out a trained nurse, a luxury for China, who was a valuable help to him, especially as he was isolated from the help of other physicians. His work at Kucheng was of a pioneer nature, and attended with the usual difficulties in establishing a new medical work. But Dr. Gregory was successful from the first, and did a great deal toward removing prejudice and winning the good will of the people. His departure was felt to be a great loss to that station.

In the autumn of 1894 Mrs. Gregory and the two children returned to the States, preceding him by one year. Dr. Gregory thought a great deal of his family, and the separation, even for a year, was very hard for him in his isolated condition. But he worked on patiently, attending faithfully to the duties of his post. August 1st, 1895, came that awful thunder-bolt out of a clear sky, in the shape of the Hwasang massacre. Dr. Gregory was the only physician within a hundred miles, and it was necessary for him to go and render the needed help. This experience was particularly sad and trying to him, as he had been the physician to all those who were massacred. It was most heart-sickening for him to go and treat the mangled victims who were still alive ; and gather up the mangled remains of his

associates in the Kucheng field, and get them conveyed to Foochow for burial. It was a heavy strain even upon a physician's nerves. Then followed the long tedious trial and execution of the murderers, most exasperating to him, as many of the guilty were known to him, and probably some of them had received medical favors from him.

Soon after this trying affair he started for home by way of Germany, intending to spend a year in post-graduate study, to compensate for what he had lost by several years of isolation. But on the way, hearing of his father's severe illness, he hastened home to see him once more before his death. Not long after the death of his father Mrs. Gregory took ill of spinal meningitis, and after a short illness, she passed on before, leaving him and the two little children all alone, with all his hopes for the future crushed.

Mrs. Gregory was one of the most estimable ladies that ever entered the mission field, and her death was a great loss. After these sad and disappointing experiences, Dr. Gregory removed to Maquoketa, Iowa, to engage in general practice, and in a short time he took diphtheria from one of his patients, and after a brief illness, went on to receive his reward, just two months after Mrs. Gregory's death.

Dr. Gregory was a perfect gentleman, devoid of all sham, generous hearted, straightforward, conscientious, and thoroughly upright. He was a skillful physician, quite above the ordinary practitioner. It is seldom in the history of missions that we find recorded such a rapid, unbroken series of sad experiences. It is sad also to think of the two little orphaned children, left alone in the world, but it is hoped they will find kind friends to care for them and give them a proper Christian training. The thought of these things should draw us nearer to God, and make us more appreciative of the daily blessings we are permitted to enjoy.

We are fully conscious of the many defects and incompleteness of this tribute to our professional brother, but missionaries, and particularly medical missionaries, are not so plenty that we can afford to let their decease pass without paying some tribute to their memory.

H. T. W.



Correspondence.

DEAR DR. STUART.

In my paper, published in the March number of this Journal, I passed over the solitary actively mobile free corpuscles which abound in culture fluids with the remark, "Some of them are tubular, with an opening at each end." I find, however, that these are very rarely to be seen; the vast majority have but one opening, and are identical in all respects with bodies often to be found in human blood infested with this parasite. After a period of solitary existence, of variable duration, two or more conjugate, become immobile, and start on a cycle of development of a most interesting nature. This is described in detail in my Customs' Medical Report for the half-year ending March 31st, 1897.

As regards the zoological position of this parasite, the same Report contains my reasons for considering it a Corticate Protozoon, probably belonging to the genus *Trichomonas*, to which belong the parasites found by sundry observers in *healthy* rats and hamsters, in certain fish, and also associated with the Indian cattle plague "*Surra*," a disease the symptoms of which correspond precisely with those of a cattle plague which devastated Shantung, as well as other provinces, in the summer of 1895. Its nature was not then recognised, so far as I have heard.

If this conjecture prove correct, and the *surra* parasites be identical with the human ones lately described, it is obvious that the widespread human infection must be attributed to those of the affected cattle which recovered from the plague, but in whose blood the parasites persisted. Their milk must have been the channel of infection.

Provisionally, *i.e.*, until experts have investigated and decided the matter, I propose the name *TRICHOMONAS HÆMATOIDES* for this parasite; hæmatoides (*αἷμα, εἶδος*), on the analogy of the French hæmatié=blood corpuscle, on account of the strange mimicry of the red corpuscles by the adult free blood forms.

It may be of service to intending investigators to describe what I have found to be the best means of recognising and isolating the above mentioned corpuscles from the other formed elements of infested human blood. Smear two cover slips in the usual way; let dry spontaneously; fix in absolute alcohol for 3 minutes; let dry; float face downwards on a 1 % watery solution of methyl green, containing also 1 % of acetic acid, for $\frac{1}{2}$ -1 hour. Wash quickly in distilled water; let dry; mount dry.

The acetic acid causes all the normal formed blood elements, and many of the abnormal ones, to swell up and become invisible. The bodies referred to are unaffected by the acid, and take the stain well, as do the various vegetile growths which result from their sprouting and union.

E. W. VON TUNZELMAN.

[In Dr. von Tunzelman's article in the March number of the JOURNAL in the note at bottom of page 15, the parenthesis in the sixth line should read, "*or, by exposure to Osmic Acid vapour for 15 seconds,*" (not *minutes*).

In the last line the proper name is Chenzinsky.

Also, on page 9, last line, "On Sang" should be "Le Sang."—Ed.]

Hospital Reports.

HOSPITAL REPORTS.

Moukden Medical Mission,	By DUGALD CHRISTIE.
Medical Missionary Society in China,	„ J. G. KERR.
Lao Ling Medical Mission,	„ F. W. MARSHALL.
Tai Yuen Fu Medical Mission,	„ E. H. EDWARDS.
Chi-nan-fu Medical Work,	„ J. B. NEAL.
Dispensary and Hospital, Taiku, Shansi,	„ W. L. HALL.
Hangchow Medical Mission,	„ D. D. MAIN.
Church of England Medical Mission at Peking,	„ Miss MARSTON.
Pakhoi Hospital	„ L. S. HILL.
London Mission Hospital, Tientsin.	
Hospital and Dispensary, Tengchowfu,	„ W. F. SEYMOUR.

The above Reports received by the Editor since the publication of the last number of this Journal suggest the far-reaching influences of the humane work of medical missions. From the north-eastern province, Manchuria, Dr. Christie reports that his work suffered no cessation during the Japanese war, although for a time it was removed to Newchwang, where a Red Cross Hospital was established and more than 1,300 patients seen during nine months. The extreme south of China, Pakhoi, 430 miles west of Hongkong, and the centre of a large foreign trade, has been able to treat 15,000 patients in its Dispensary work during the last year and to treat 547 persons in the wards of the Hospital. This small place is visited by "men from nearly every town in Kwang-si and also from many places in Kwang-tung, besides a few from the remoter provinces of Kwei-chow and Yun-nan." Inland cities such as Tai-ku and Tai-yuen-fu in Shansi

province and Chi-nan-fu in Shantung, which are out of the track of any traveller, except such intrepid ones as Mrs. Bishop, send tidings of a large amount of relief. New places are being opened with great success, while older work, such as that in Canton, which has been in operation since 1838, has never enjoyed so much prosperity as at present. The work of the medical missionary in Japan and India soon passed away on account of the rise of native practitioners, but it will be long before such a time comes in China. The foreign physician is still often obliged to spend much of his time undoing the bad work of the "native miscreants who are supposed to practice the healing art" as Dr. Marshall characterizes the native doctors—and yet these same men are greatly trusted by the people. He is a missionary of new methods of alleviating suffering as well as of the good tidings of the Gospel. The demand for his presence seems to be rather increasing than passing away, both among the common people and among the higher classes. A vast mass of unrelieved suffering still lies before him.

Dispensary.—The work of the Dispensary continues to increase in all of the places reporting. About 100,000 cases were treated, giving an increase on the whole of more than ten per cent. This means a great deal of time consumed, even if the doctor "did nothing more to the patients than feel their pulses and look at their tongues," but this is insufficient, for "many of them have long and sad stories to tell which must be listened to with interest and sympathy." Dr. Main remarks that "this kind of work is most exhausting, especially in the hot weather, when the patients are numerous and when the odours from wounds and putrifying sores are thick enough to cut with a

knife." Along with these difficulties come also other "annoyances, such as patients asking for treatment for friends or relatives who cannot come," mentioned by Dr. Hall. It is encouraging also to note that nearly all speak of improvement in the class of cases that come for treatment. Previously they were often old chronic cases that could not be cared for outside of long hospital treatment or of surgical operations, but now it is noted that the number of cases that come when the first symptoms of disease appear is gradually increasing. Still cases do come asking to be admitted if only they can die in the Hospital, as it is more comfortable there than at home, but they are becoming fewer. One report says that the patients "follow instructions better, put themselves more completely in our hands and show more gratitude for what is done for them." In nearly all of the Hospitals a small charge is made for registration of dispensary patients, but in Chi-nan-fu Dr. Neal says that he "tried charging a small entrance fee to all patients able to pay at the city dispensary, but it did not seem to work well. We have not yet been convinced that the charging of fees in what is supposed to be a purely benevolent work is calculated to produce a favorable impression for Christianity." The general practice seems, however, to be the charging of a small fee to ensure that cases are *bona fide*. Even in the old Canton work we find that \$287 was collected last year from registration fees. Religious work is always conducted in connection with the dispensaries, and the patients are preached to usually by a native assistant before the clinic is opened. However patients are not obliged to listen, for they can come and go at their own pleasure, but often it is found that they do "listen with rapt attention." Although the religious side of the work is emphasized yet we find one Report maintaining stoutly that a "dispensary is not a place where powders are given rolled up in tracts and where

bottles are labeled with Scripture quotations and where so much preaching has to be listened to for so much medicine dispensed."

Hospitals.—The number of in-patients has increased in every instance, and often wards have been overcrowded because patients would take no refusal. In one city a man threatened to take opium and commit suicide if he were not admitted, as he had come several hundred miles to be treated and had spent fourteen days on the journey. Compared with home hospitals the wards of all China hospitals would appear to a visitor to be much overcrowded, but even the congested wards are often not large enough, and verandahs, outhouses and hallways are filled. The popular dread of the foreigner and the suspicion of his wily ways gradually give way as the sufferer finds his wounds healing and health returning. In many places difficult operations were once impossible on account of the fear of riotous demonstrations in case of resultant death, but now in older places not even bonds from the interested family are required. A few demonstrated cases of success soon clear away all doubts and overcome prejudice. In many places all kinds of surgery are attempted with as much freedom as in a home land. Many interesting instances are given of the gratitude of patients which speak far more clearly than the meritorious board hanging on the wall. In one place more than Tls. 120.00 was received as free-will offerings from patients who were nearly all exceedingly poor. In another place several poor patients have put their cash together in order to make up a sum worth giving. A heroic instance is also mentioned of a young man in Manchuria, who hired himself out as a laborer before leaving, in order to repay the money expended on him while in the hospital. So many cures have been accomplished which seemed impossible to the native doctors that in an instance mentioned by Dr. Edwards miraculous powers were attributed

to him and his assistants, for they were summoned to restore life to a child already dead from drowning. Although instances of ingratitude and suspicion are mentioned the whole tenor of these reports is full of hopefulness and kindly spirit toward the afflicted Chinese.

Many contributions have been made by medical missionaries in China toward the progress of general medical science, and in these reports many important items are mentioned which would interest the profession at home. As an example we quote the opinion of Dr. Kerr concerning the Bubonic Plague: "The city of Canton was again visited by the plague in 1896. During 1895 the disease was not seen, and there were very few if any cases. The epidemic of 1896 was not so violent as that of 1894, but it ran its course in the same way, beginning in the early spring and ending in mid-summer. In the absence of statistics, any estimate of the number of deaths is mere guess-work, and where a fatal disease is prevailing there is sure to be exaggeration. There is no doubt great exaggeration in the historical accounts of the terrible fatality of this disease, for they are made up often during times of panic. In Hong-kong, where careful records were kept, the total number of cases brought to notice was 1,204, of which 1,097 were fatal. The largest number of cases in one week was 100." In Canton the usual large number of cases of Lithotomy and Litholapaxy was treated with splendid success. In all 79 cases were operated on, of which only 4 proved fatal. One-half of these patients were under 20 years of age. The success of Dr. Kerr and his associates in these operations has given them an international reputation. We do not notice in other places the prevalence of any one particular disease calling for surgical aid unless in the cases of the Chinaifu and Moukden hospitals, which have a very large list of eye operations.

The most discouraging and unsatisfactory reports are given concerning *opium patients*.

They are difficult to manage, and resort to all sorts of devices to secretly obtain opium. "They hide the opium in the toes of their shoes, in their pigtails, under the lining of their clothes; the bottom of a match box is a favorite place with the matches all beautifully arranged on top." They try to escape from the Hospital by threatening the gate keeper, by giving tips to the care-taker, or forging letters from home summoning them at once on important business. In one case in Pakhoi several patients even scaled the walls so as to be able to get at the very thing from which they were supposed to be fleeing. It seems to be the common opinion that very few opium smokers are really cured so that they never return to the habit. All that mention the subject agree in denouncing it as an unmitigated curse and one of the greatest hindrances to the advancement of Christian work. Although the results are so meagre it is the opinion of all that the work of rescuing these unfortunates cannot be abandoned. Something must be done to relieve special cases, and there must be a steady struggle against the general evil. All agree in denying the common assertion that the habit is a comparatively harmless one.

One of these Reports is that of a Mission to women and children exclusively, but in all the other reports special mention is made of this department. In some places there are special lady doctors who attend wholly to the women, in other places a foreign trained nurse attends the wards under the supervision of the physician, while in some places no such assistance is at hand, and the one physician is obliged to attend both men and women. The special growth of this work is referred to in several instances, and in one case it is said that it is now larger than the whole general clinic was a few years ago. Where Chinese buildings are used two courts are provided, one for men and the other for women. In some cases large foreign buildings have

been specially erected for the woman's wards, but in others all are accommodated in a common building separated as well as possible by hall ways into distinct wards. A wail of distress comes from one city, because after the completion of a beautiful hospital for women the lady doctor was married to a clerical missionary in another city, and now the work has to wait for another arrival.

Evangelistic.—Much direct preaching of the Gospel is done not only in the daily clinic, but at the daily prayers and the regular Sunday services. This is in addition to the work done in the wards at the bed-sides. One of the best organized plans seems to be that in use at the Moukden Hospital, where more than one evangelist is employed. In addition to the regular work done in the Hospital, tours are made to the homes of patients. On one such trip the evangelist "met not a few old patients who are now members of the Christian Church. There are several instances where former patients gathered around them small bands of believers and inquirers. One man, who was formerly in the Hospital and professed faith in Christ, has just returned from his home a hundred miles away. He says that there are now twenty enquirers in his village who meet regularly in the room which he has provided and fitted up. None of them are yet baptized, nor is he, but he has taught them as best he can. He has come back to seek baptism for himself and to ask if a pastor or evangelist can be sent to instruct and baptize the others." As a result of this systematic and efficient work 105 applicants for church membership were received during the year. In another instance mentioned by Dr. Marshall a man who had been blind for many years, but by operations had had his sight restored, was the means of gathering a number of others in his village home into the church. In Tai-yuen Fu eighteen men and eleven women have given their names as enquirers. In the London Mission

Hospital, Tientsin, an interesting case is given of a "man Chia, who after being baptized was afraid to go home, as he feared his elder brother. We all prayed that courage might be given him, and then he decided to go home. About a fortnight later one morning I found him standing at the Dispensary door; he said he had come to tell me that his brother, whom he so much feared, was now too a believer. One day as Mr. Pyke was holding a service in his West Gate chapel a man came up asking to be received into the church, and he proved to be this very brother. His old mother also was touched by the testimony and died believing; also some twelve people in his village were influenced by him." In addition to those who openly profess Christianity there are many who return to their homes confident of the truth of Christianity, who are prevented from believing by fear of the opposition of their friends.

Lepers Work.—This is mentioned in the reports from Hangchow and Pakhoi Hospitals of the Church of England Missions. The work at Hangchow has only been recently started by special contributions toward which the Shanghai community subscribed no small sum. In the Home are 24 lepers, some of them in the City Home and others at the Lake Home. They are all comfortably housed, and their needs are well provided for. Some remain until they die, but others finding that their disease becomes no better return to their homes. In Pakhoi more than 100 are in the Leper Hospital as permanent residents. There are two large compounds, one for men and the other for women, four large wards, a chapel, a dispensary, a printing-room, a work shop and cook room with 100 fire places, for each Chinese likes to cook his own food. There is also a large garden where those who can cultivate vegetables for their own use. All patients are expected to learn both the native and the Romanized system of reading and writing. Whereas not many can be cured all are

cleansed and relieved. Nearly all become Christians, and many of them give good testimony, both in life and death.

Medical Training Classes.—At Canton, Hangchow, Chi-nan Fu, and Moukden special attention is given to this branch of work. Dr. Main considers this work all important, as foreigners cannot do all the work that needs to be done, and as the ordinary native doctors are such a "pack of quacks and impostors." Dr. Neal has a class of five students, who have two recitations daily and assist each afternoon in the dispensary. These students, after spending a time under Dr. Neal, are sent to another station, where under Dr. Johnson they pursue a course of study on other subjects. This co-operative method of teaching is highly spoken of by Dr. Neal, who thinks it the solution of the problem of teaching medical students. Without wishing to criticize, it seems to the writer that with the press of daily clinics and hospital duties a physician would not be able to put much force in his teaching, and that it would be best in all instances to set a man apart whose sole duty would be to teach and let the other doctors of his district co-operate with him in such instruction as they have leisure for and in the practice of medicine and surgery. In Moukden Dr. Christie seems able to retain his pupils after they have completed their course, even though they are able to obtain much higher

salaries elsewhere. One of his assistants had a button of the fifth rank conferred upon him by the Governor-General in recognition of his services to the soldiers during the war. The chief work on this line is done at Canton, where 23 young men and 6 young women were connected last year with the Medical School. The junior students take instruction in lectures and text-books while the senior students have daily opportunities of seeing and examining disease in the wards. Quite a large staff of instructors is provided. One instructor was called to a professorship in the Imperial Medical College at Tientsin. Two graduates of the school were examined by the Medical Board of Honolulu, and were given license to practice medicine in the Hawaiian Islands. A large sale of medical text-books, amounting to 8,070 volumes, is also reported, which shows that foreign methods of medical science are being closely studied by the Chinese. This medical school is a decided success, and ought to be multiplied in many parts of China.

There are many other points in these Reports which space does not permit us to mention, such as the subscription lists from foreigners and Chinese and the special cases of professional treatment. These can best be read in the words of the physician himself as given in the Reports.

J. C. F.



Notes and Items.

"One of the highest uses of a monarch is his ability to recognize individually, appreciate and reward signal services in any of the lines of the world's progress, as has lately been shown by the King of Italy in giving the Grand Cordon of the Crown of Italy to Dr. Behring for his discovery of the antitoxin of diphtheria."

Sir Joseph Lister says that if bacteriologists had done nothing more for mankind than to discover the comma bacillus of cholera, they would well deserve universal gratitude; for, although other conditions than the presence of the bacillus are necessary for the production of an epidemic of the disease, it is through the certain diagnosis of the essential cause that the invasions of the scourge have been so successfully expelled of late years from England.

The earliest known bacteria have been found on fossil vegetation of the Devonian age; they are two species referred by Renault to the genus *Micrococcus*.

The two items following came to the Editor from some place in the north of China, in the shape of a racy little mission sheet, apparently edited, mimeographed, and published by some enterprising medical missionary, the interest of whose work is only surpassed by his exceeding modesty:—

"An example of one of China's many absurd and superstitious customs came under our notice a few days ago. A very sick patient had been carried over one hundred *li* on a stretcher, to be treated by the foreign physician, but as it was so near the Feast of Lanterns and in

the first half of the first Chinese moon, the people objected to having the patient enter our hospital gate, as he would first require to be carried through a common gateway, and would spoil the luck of the place. Earnest appeals were made to them asking if human life was not more important than custom, but of no avail. The result was that the patient had to be carried to an inn, where he was examined, only to find that he was in a dying condition, quite beyond treatment."

"The most interesting case that has been in the hospital here, for some time, is that of a boy of thirteen, who was operated on last Saturday for stone. The stone weighed over two and a half ounces. The lad had scarcely known what it was to be without pain since he was two years old, seems very grateful, and is apparently doing well."

The party of the other part is determined to be heard in this world, apparently to the end of time. Dr. Holmes somewhere speaks of a sort of *pica* in some minds, which seems to set them against any generally received belief, so that we are apt to find an anti-vaccinator to be also an anti-vegetable eater, an anti-vivisectionist, etc., all rolled into one; and it would certainly seem that one well-known New York physician has the same squint-eyed crook in his make-up; for otherwise he could not keep up his persistent battle against the plain testimony of facts in favor of the beneficent efforts of the diphtheria antitoxin, as testified to by Dr. J. Lewis Smith, who has kept a record of cases in the New York Foundling Asylum for seven years, and finds, where in 1890 the deaths were a little

more than one-half of those attacked, and an almost equally large proportion till this last year, in which antitoxin has been used. Under this treatment there were in July, 10 cases, with 9 recoveries; in August, 6 cases, with 6 recoveries; in September, 5 cases, with 5 recoveries; in October, 19 cases, with 18 recoveries; in November, 25 cases, with 24 recoveries. It should be remembered that in an asylum or a hospital, where experience has taught the value of early recourse to the remedy, it is found that next to no deaths occur where it is used within 27 hours of the attack. Here they regularly expected the membrane to loosen in 24 hours, and sometimes it came off in 8 hours after using the antitoxin. These statistics were brought forward in a session of the section of Pediatrics and of course adult experiences were left out. Dr. E. Rosenthal, of Philadelphia, said that out of 166 severe cases of diphtheria, that he had treated with antitoxin, only 4 had died. Formerly he had lost 68 out of 100 cases, and before the use of this agent he had seen no case that followed measles recover; but now death was rare in such cases. Dr. Biggs had collected a large mass of statistics from Paris, Berlin, New York, and from all the towns in France with population exceeding 20,000, and in Germany with more than 15,000 population; and all show a great and steady decrease in the absolute number of deaths, and all tell the same encouraging story of man's mastery over one of the greatest of scourges. All these swell the chorus of testimony to the value of early use of antitoxin. Virchow has probably seen many rosy hopes of the benefits to come from various specifics perish unfulfilled in his long life, and he early adopted a skeptical attitude and tone against the serum treatment; but more than two years ago he said that so many figures were favourable to its value it would be a neglect of duty for a physician not to

use it; and now, with the cumulative experience of the last two years, he says: "Theoretical considerations must yield to the brute force of statistics." Dr. Koester had seen much of diphtheria in connection with the Health Department, and had injected ninety-three patients; only two of the number had died; and to him it seemed that "the physician who had a case of severe diphtheria and did not use antitoxin committed a criminal offense."—*The Independent*.

AWFUL ARMENIAN PRESCRIPTIONS.

For some weeks past the *Daily Graphic* has been publishing an account of a journey through Armenia, and there is one paragraph, from the issue of March 11, which will interest most of our readers: "The people here—and in the Orient generally—always take it for granted that a European is a doctor, and our advice has been asked upon every kind of malady. One patient was a man who had had dysentery for several years. He had been recommended by a wise man from Persia to shoot a hare and burn its skull to ashes, which were then to be swallowed in water. This prescription had not cured him, though a friend of his, suffering from ague, had derived great benefit from it. The conversation turned on the advantage of having good doctors, and one man related how his wife had been treated for a headache. Several old women took her in hand. They bound a towel about her forehead, placed a brass pot on her head, filled the pot with boiling water, and for about two hours kept up the temperature by ladling out the cooling water and lading in boiling water in its place. At the end of two hours the patient had lost her pain: she was dead. This gives some idea of the awful suffering that people in the East have to undergo, whether they be Christian, Mohammedan, or Heathen, and it is easy to understand that a medical missionary will often

be received with open arms, and will soon gain such influence that he has opportunities of preaching the Gospel which do not occur to others. It also illustrates the fact that Easterns believe often that Europeans can help them in their times of suffering, and if they do not it is because they won't, and they will not believe when they are told that they don't only because they can't.—*Missionary Herald*.

HYGIENISTS TO BLAME.

A witty article in the *Revue Médicale de Paris* laments the growing scarcity of sickness, and the increasing number of physicians (*Jour. Amer. Med. Ass'n.*) It denounces Jenner, Pasteur, etc., as guilty of depriving their colleagues of their daily bread, and wrecking the profession. Especially is this the case in cities where prophylactic and hygienic measures are most strictly enforced and the sick number less in proportion. It adds a few figures in confirmation from the death record of Paris during the last ten years, stating that the figures to date for 1896 show even more marked reduction:—

Deaths caused by	1885 to 1890	1890 to 1895
Small-pox,.....	1,271	655
Scarlet fever.....	1,225	946
Measles.....	6,671	5,192
Diphtheria.....	8,383	7,588
Typhoid fever....	5,903	3,493

The following appeared in the *Bristol Medical and Chirurgical Journal* in a review of a late English work in Bacteriology:—

The chapter on the composition and morphology of bacteria is not one of the happiest efforts. Nencki is credited with the discovery that “the chemical analysis of bacteria in the active state consists of 82.42 per cent. of water,” and that mycoprotein “has the composition C 52.32, H 7.55, N 14.75.” Whether this observer is in the habit of calculating his results on a basis of 74.62 parts, or cautiously leaves a margin of more than 25 per

cent. for undiscovered elements, does not appear. But a still more striking instance of the danger of incorporating interesting pieces of information without due consideration occurs a page or two later. After being told that the weight of an average bacterium is $\frac{1}{10,000,000,000}$ milligramme (Nägeli), and that, doubling hourly, one germ will, under ideal circumstances, become in three days four thousand, seven hundred and seventy-two billions (Cohn), both of which statements are sufficiently near the truth, we learn that the “demnition total” would, according to a most eminent writer on the subject, “weigh no less than seventy-five hundred tons.” At first sight it would seem that an explanation has at last been given of the exorbitant prices charged by scientific instrument makers for incubators. A broth culture measuring 10 c.c. often contains ten thousand million bacteria, weighing on this basis of calculation about thirty-five pounds. On a moderate computation the cotton wool plug will weigh as much, and the tube and culture medium a thousand (more probably twenty thousand) times as much as the bacteria. A pressure, therefore, of about fifteen tons will be brought to bear on the thin sheet metal of the incubator by each culture tube; and though it is true that in general the former is shielded by the bottom of a thin glass beaker supporting the tubes, it is not surprising that the effects of their enormous weight have to be counteracted by a subtle system of struts and stays at prodigious expense. On closer inspection, unfortunately, this explanation is found to be scarcely consistent with hard facts. If a bacterium weighs the one ten-thousand-millionth of a milligramme, the weight of ten thousand million will be one milligramme; of a billion, one decigramme; and the weight of four thousand, seven hundred and seventy-two billion bacteria will be 477.2 grammes, or slightly more than one pound. It is apparently impossible to deny the

British origin of this poetic flight; but it seems a thousand pities that the story of the prolific germ did not find a more appropriate birth-place in the land of tall tales.

A MALIGNANT MUNICIPAL MALADY.

We have noticed for several years, in various parts of the country, particularly in cities and towns of larger size, an infectious malady, vulgarly called "boodle," that is both sporadic and epidemic in character.

Persons known to be entirely free from, and supposed to be immune against this infection, when they get into municipal rooms, because of a lack of previous efficient disinfection, are soon attacked, and so malignant is the type of the disease that often many others brought in contact with them "break out" with it, in an aggravated form.

The disease is somewhat unique in character. The powers of locomotion are not only affected, but are often greatly quickened; the appetite is somewhat depressed; the speech is somewhat unreliable; and toward the last there is often marked insomnia. The will power is more or less perverted, and there is a tendency to what is known as the "evil eye." A prominent symptom is a "light-fingered" condition, that manifests itself in a digital adhesiveness, with itching palms, and a wonderful affinity for *aurum* and *argentum*—two well known precious metals. A marked peculiarity of the human family is that although the dangers referred to are well known, as well as the direful results, there are always persons willing and apparently anxious to expose themselves to the contagion.

The failure of the Hahnemann theory of practice, "*similia similibus curantur*," is admirably and incontestably demonstrated in the treatment of this disease; for the more these "*similia*" remedies are administered the more malignant and incurable the disease becomes. Perhaps

the use of *Aurum* and *Argentum* in infinitesimal doses might, in some cases, be somewhat helpful.

The best remedies we have known, and which if vigorously, faithfully, and promptly administered in allopathic doses, would measurably if not entirely stamp out the disease, are rigid inspection, detection, prolonged isolation, the wearing of striped clothing, and short-cut hair. Sulphur fumigation, *a la Lucifer*, with intense heat, would effectively destroy the auriferous and argentiferous germs.

In some places the disease has become so alarming, and the disastrous results so aggravating that the subjects of it have been suspended by hempen cords. This cure, which is said to be very effectual, has not the sanction of the law, and is un-Christian.

It is proper to state that persons in municipal positions are not the only ones subject to this malady. Bankers even, and public officers of various grades have been badly affected. The symptoms and progress of the disease are the same, however, in all cases, and the treatment is the same.—*Iowa Board of Health Bulletin*.

NOT ON THE MAP.

A gentleman who was traveling through one of the most insalubrious districts of India found living there an Irishman of very contented appearance.

"I don't see how you can live in a place," said the traveller, "where people die so thick and fast."

"Tell me the place, sir," said the man, "where people never die—tell me the place, and I'll go there myself to end my days."—*Daily Lancet*, Philadelphia.

A REASON FOR PRIDE.

"I got my picter in the paper," he said to his neighbor. "Did you see it?"

"I reckon I did."

"Purty good likeness, wa'n't it?"

"First rate. Only I don't see why a man should be so proud o' medicine, ez ter go an' hev it wrote up. It don't indicate no special superiority over the rest o' the human race."

"Oh, yes, it does. That jes' shows you ain't studied it out. It shows what a wonderful good constitution he's got."—*Washington Star*.

A HALCYON TIME FOR DOCTORS.

Physician of the New School (after turning X rays on the patient)—"Your case is a somewhat complicated one. There is a slight trouble with your left lung, and I observe enlargement of the liver and fatty degeneration of the heart. Kindly hand me that \$2.54 in your right-hand trousers pocket and I will prescribe for you."—*Puck*.

NEWSPAPER WIT.

An item is going the rounds of the press, both medical and general, to the effect that a man constantly in fear of becoming unconscious, of being carried to a hospital, and operated upon before diagnosis has been made, carries in a conspicuous place in his clothing the inscription: "My appendix has been cut out."

This is undoubtedly the invention of some would-be newspaper wit. Nevertheless it carries with it a moral. It is notorious that operations for diagnosis are entirely too frequent, consequently it behooves every medical man to "go slow," and if of the younger rank to await the advice of counsel and the result of careful deliberation.

Paul Louis Couriera, Frenchman, is a true philosopher. Having been recently assailed with great bitterness by a French professor, he quietly remarked: "I fancy he must be vexed. He called me Jacobin, rebel, plagiarist,

thief, poisoner, forger, leper, madman, impostor, libeller, a grimacing rag picker. I gather what he wants to say. He means that he and I are not of the same opinion, and this is his only way of putting it."—*New York Tribune*.

MARRIAGES.

At the Cathedral, Shanghai, on 22nd May, by the Rev. H. C. Hodges, M.A., ALBERT GEORGE PARROTT, M.R.C.S., Eng.; L.R.C.P., Lond., to CONSTANCE MARY, second daughter of F. W. Reynolds, M.A., Redland, Bristol, Eng.

At Tientsin, May 31st, Rev. JAS. MENZIES, M.D., to Miss DAVINA G. ROBB, both of the Canadian Presbyterian Mission, Honan.

At the Cathedral, Shanghai, on the 23rd of June, by the Rev. H. C. Hodges, M.A., MARIE EMMA, eldest daughter of Dr. and Mrs. S. P. Barchet, of Kin-hwa, to JOHN TREVOR SMITH, of the British and Foreign Bible Society.

DEATHS.

At Ching-chow Fu, Shantung, on February 16th and 18th, STANFORD, aged 9½ years, and RUSSELL, aged 8 years, the dearly beloved sons of Dr. and Mrs. J. R. WATSON.

At Tungchow, Shantung, 31st May, the wife of Dr. LEWIS, American Presbyterian Mission.

At Chang-poo, Amoy, on 10th June, JANE MUIR, infant daughter of Muir Sandeman, M.A., M.B., C.M., aged three months.

DEPARTURES.

From Shanghai, 10th April, Dr. ETHEL GOUGH, Hankow, for England.

From Shanghai, 17th April, Dr. and Mrs. D. CHRISTIE and family, Moukden, for Scotland.

From Shanghai, 26th April, Dr. and Mrs. B. C. ATTERBURY and family, Peking, for U. S. A.

To the Members of

THE MEDICAL MISSIONARY ASSOCIATION OF CHINA.

DEAR FRIENDS :—

I desire to make out a correct list of the members of the Association with the address of each, but this cannot be accomplished without your assistance. The following list is made up of one found with the records that were turned over to me when I assumed the duties of Secretary, and of names secured from back numbers of the Journal. I am aware that it is not correct in several particulars, and perhaps some names are omitted that should appear. Kindly send me whatever corrections you know should be made, so that a full and correct list can be published later.

Please do not wait for a convenient time, but do it now.

Address,

ROBERT C. BEEBE, M.D.,
Nanking.

<i>Name.</i>	<i>Qualification.</i>	<i>Station.</i>	<i>Post Office Address.</i>
Anderson, P.	L.R.C.S. & P., Ed.	Tai-wan Fu.	Tai-wan Fu, Formosa.
Atterbury, B. C.	M.D.	P'ao-ting Fu.	Tientsin.
Barchet, S. P., Rev.	"	Kin-hwa.	Ningpo.
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Beebe, R. C., Rev.	"	Nanking.	Nanking.
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Bliss, E. L.	M.D.	Shao-wu.	Foochow.
Bliss, R. C., Miss } (Mrs. Noyes)	"	Canton.	Canton.
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Browning, F. W.	L.R.C.S. & P., Ed.	Ningpo.	Ningpo.
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Canright, H. L.	"	Chen-tu.	Hankow.
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Cousland, P. B.	M.B., C.M.	Ch'ao-chow Fu.	Swatow.
Cox, G. A.	L.R.C.P. & S.	Chinkiang.	Chinkiang. [ver, Col.
Crews, G. B., Rev.	M.D.	Peking.	334 Gallup Av., Den-
Cross, S. J.	M.B., C.M.	Eng-ehhun.	Amoy.
Curwen, Eliot	{ M.B., B.C., L.R. } { C.P., M.R.C.S. }	Peking.	Peking.
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John D. Thomson, M.B., C.M.	Hankow.
J. Frazer	Tientsin.
Henry Layng, M.R.C.S., L.R.C.P.	Swatow.
A. Irwin	Tientsin.
C. Zedelius, M.D.	Shanghai.
Chas. A. Oliver, A.M., M.D.	Philadelphia, Pa., U. S. A.

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The Ven. Archdeacon Thompson	Shanghai.
Rev. J. M. W. Farnham, D.D.	Shanghai.
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Rev. D. H. Davis, A.M.	Shanghai.
Rev. C. C. Baldwin, D.D.	Foochow.

Official Notices.

The following persons have been duly elected members of the Medical Missionary Association:—

JAS. BUTCHART, M.D., Nanking.

ARTHUR DAVIE PEILL, M.B., C.M., Hsiao-chang, Chih-li.

FREDERICK H. JUDD, B.A., M.B., B.C., Chefoo.

E. D. VANDERBERG, M.B., Nodoo, Hainan.

The China Medical Missionary Journal.

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Original Communications.

[No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editor on the first day of the month preceding that in which they are expected to appear. The editor cannot undertake to return manuscripts which are sent to him. A complimentary edition of a dozen reprints of his article will be furnished each contributor. Any number of reprints may be had at reasonable rates if a *written* order for the same accompany the paper.]

MALARIA AND ITS PARASITE.

By N. MACLEOD, M.D.

The term "malaria" covers a multitude of diagnostic sins abroad and at home. Every feverish or other condition abroad that cannot be entitled other than malarial is apt to find a haven in that designation, while every patient in such condition who has not learnt of his malarial possession abroad is not unlikely to be informed at home that he is so blessed (or cursed). Anything that would enable us to apply the term with a clear conscience, one would think, would have been hailed with joy. Laveran's discovery of the malarial parasite, made in 1882, has not yet met with such a reception at the hands of his medical brethren, so far, at least, as its application to the examination of the blood in cases of fever is concerned. If Laveran's views are right, there cannot be a shadow of doubt that every one who is not applying them to his daily work in the shape of microscopic examination of blood is certainly guilty of a grievous sin of omission, not to speak of commission when treatment is had recourse to. I am ashamed to say that although I had read of the malarial parasite as early as 1883, I had not seen it till 1894, when I was introduced to the living, and by Thin to the dead, organism, after a perusal of the Sydenham Society's translation of Marchiafava, Bignami and Mannaberg's works. That of the latter author affords a fitting introduction to any one wishing to make a close acquaintance with the subject.

Since December, 1894, I have examined over 800 specimens of blood from a variety of cases with the aid of a Powell and Lealand's apochromatic, homogeneous immersion twelfth, compensating eye-pieces and an achromatic condenser. I have not met with any one yet who has hesitated to accept a demonstration by these means in a good specimen and with a good light, as illustrating

the appearances described by Laveran. If there be any one who is sceptical as to the relationship of the parasite to the fever, let him observe the different stages of growth of the parasite seen to occur with absolute certainty between one paroxysm and another and to recur again and again with each paroxysm in a simple tertian intermittent. If he still refuses to believe that that form of malarial fever is a parasitic disease, he must indeed be hard of conviction.

Any ordinary microscopist, following the directions usually given for preparing malarial blood films, if he does so within 12 hours of the time that a paroxysm is due, can hardly fail to make out in a good specimen the pigmented, endocorpuscular parasite of tertian or quartan malarial fever. To those not accustomed to this method of blood examination, the following two hints will save a good deal of time: any specimen (blood film) should be discarded as useless at once if it does not present fields where the red corpuscles are not lying flat on their sides and overlapping, and the corpuscles are not uncrenated; and, second, no appearance about which there is any doubt should be accepted as an organism. About living, pigmented parasites there never can be any doubt; these and the crescents are the bodies to be searched for by those first making their acquaintance with them. Unpigmented parasites are the most difficult to detect, and only to be accepted as such if they are seen to move and continue to do so; manifest changes of shape must be observed, and they must be endocorpuscular. These considerations apply only to the examination of the fresh blood.

(For those who cannot conveniently refer to the method of preparation of the blood films, it is as follows: Finger tip, slide, cover glass and needle being first cleansed with soap and water, then with water and finally with absolute alcohol, are allowed to dry. The finger tip is then pricked and a drop of blood of pin head size is gently squeezed out. The cover glass should then lightly touch the blood drop and be allowed to fall on to the slide. When the blood film runs out to the edge of the cover glass, too much blood has usually been taken, and the fields will not be as described above. The cover glass must never be squeezed down on the slide, else the parasites will be expressed from the corpuscles and broken up out of recognition. The film should be examined at once if possible. In the *Lancet* of 10th July, 1897, page 85, I have described the following method of preparing dried blood films—unstained—which is useful for preservation of specimens for demonstration purposes and where it is not convenient to examine the fresh blood. All that is necessary for doing this in addition to the foregoing materials is a strip of ordinary note paper $1\frac{1}{2}$ inches by half an inch with a perfectly straight edge. This straight edge is drawn its full half inch through the blood drop on the finger tip, and the strip so charged with blood is quickly drawn across the cover glass before the blood has had time to dry. In this way is spread on the cover glass (or slide if preferred) a fine blood film which dries very

quickly, and in it many excellent fields will be found with the corpuscles lying on the flat and practically unaltered. The cover glass must not be fixed to the slide by any medium which will run between the two, as this causes the red corpuscles, etc., to disappear from view. It must be mounted dry and can be gummed to the slide by a strip of thin paper with a window cut out exposing the film, when the latter can be examined with a dry or immersion lens).

THE PARASITE AS A MEANS OF DIAGNOSIS.—It is of course easy to diagnose with certainty many cases of intermittent malarial fever, but it is not always possible to do this with a first paroxysm especially when mild, nor is it advisable during hot weather to wait for a second paroxysm. The value of the blood examination was illustrated in my own practice by the following cases: Two of these occurred within four days of confinement, where the relief experienced on finding the malarial parasite in the blood was well worth the trouble of examination. In one of these cases the fever was of remittent type, there being no period of apyrexia. In only two cases of *continued* fever have I as yet found the parasite, and from the fact that it was there present in pigmented, unpigmented and sporulating stages at the same time, I regarded the fever as tertian with several generations of the parasite producing overlapping paroxysms of fever and therefore no period of apyrexia—tertian because of the characters presented by the organism.

On 2nd January, 1895, a man, just arrived from Hongkong, called on me complaining of cough without expectoration, night sweats, loss of appetite and weight, looking anæmic and slightly jaundiced. He said he had had no fever, had been ill for a month, and that his medical attendant in Hongkong had regarded him as suffering from some liver affection, producing his prescription which bore out the statement as to diagnosis. Both liver and spleen were slightly enlarged, the temperature at 3 p.m. was 99.7. The chest exhibited no abnormal physical signs. A blood examination furnished a crescent in at least every field (twelfth), and a few unpigmented endocorpuscular parasites were to be seen. At 6 p.m. I was sent for to find him with a temperature of 104.5 and a pulse of 96. Next day at noon the temperature was normal, and at 6.30 p.m. 105.2. Quinine was given that and the following evenings, and the only rise of temperature subsequently was on the next evening to 102. The crescents gradually decreased in number and were last seen on the 17th day, by which time he had regained his normal colour and lbs. 15 weight. Without the blood examination in this case, a provisional diagnosis of obscure hepatic suppuration or of tubercular pulmonary mischief might have been fairly made.

On two other occasions my attention has been directed to lung symptoms, where the presence of the malarial parasite in the blood and the rapid disappearance of both parasite and symptoms after administration of quinine seemed to justify a diagnosis of malarial fever as the offending condition. In one of

these I had regarded previous feverish outbreaks with lung symptoms as due to some tubercular pulmonary condition without physical signs. It is further interesting in this case to have observed on two subsequent occasions the rapid effect of quinine on both the parasite and the lung symptoms. About this I shall have more to say on a future occasion.

A point of interest in relation to this question of diagnosis is how far we are justified in drawing conclusions from negative results in examination. So far as I can judge from my own experience, it would have been safe to have inferred that my failure in demonstrating the malarial parasite meant the absence of malarial disease in all but three cases. These cases were, I believe, malarial in spite of failure in finding its parasite, but had taken quinine before they were seen and examined. This procedure, as has been noted by others, frequently introduces an obstacle in the way of detection of the organism, though in quite a number of cases so dosed, I have found the parasite usually with some difficulty. Failure to find the parasite or its products, after repeated attempts, would certainly justify hesitation in declaring a case malarial and in administering quinine, in the hands of one who feels confidence in his examinations, but would scarcely justify the conclusion that there was no malarial disease in a given case.

If there be such a condition as "malaria" both with and without the malarial parasite, the sooner parasitic and non-parasitic malaria are distinguished by other names the better for all concerned.

With the forms of malarial fever met with in the Shanghai district as compared with elsewhere I purpose to deal in the second part of this paper.

The parasite was not found in 80 cases of continued fever whose nature was unknown at the time of the blood examination but determined later. These consisted of 20 cases of typhoid fever, 1 thrombosis of the basilar artery, 8 influenza, 11 inflammations of various parts, 1 pneumonia, 1 bronchitis, 2 hepatitis, 2 hepatic abscess, 3 enteritis, 2 scarlet fever, 1 articular rheumatism, 13 cases of fever produced by overexcitement or exertion, and 15 cases of fever of unknown origin. Some of these last 15 cases, it may be said, might have been of malarial origin, but apart from the question of the parasite, I could not say that they were of that nature, and they all recovered quickly and completely without quinine or change of climate. According to some of the Italian writers on the subject, there are malarial fevers in which it is difficult to find a parasite in the peripheral blood vessels. They maintain that its occurrence in these vessels is accidental and not necessary and that the habitat of the parasite in these cases is the vessels of internal organs. These and other questions connected with this subject I reserve for the second part of this paper.

DIPHTHERIA.

By ROBERT COLTMAN, Jr., M.D.,

Professor of Medicine, Imperial Tung Wen Kuan, Peking.

Perhaps there is no more favorable spot on earth for the successful growth of the Klebs-Loeffler bacillus than the city of Peking. Anyone conversant with the condition of the streets and alleys of this city would be surprised if told that diphtheria was rare here, but unfortunately no such surprise is possible. Diphtheria is very prevalent and very fatal. After five years experimenting with various remedies having some reputation as either specifics, or valuable adjuvants, to successful treatment, the writer has discarded many, and narrowed down to a few that, seem in his judgment, to give fully as good results as the much praised anti-toxin in cases seen early. As the anti-toxin previously prepared has not kept well, no experience has been possible with that remedy. The writer admits that cases seen after forty-eight hours are rarely cured in the marvellous manner recorded by use of anti-toxin in the later stages and regrets that heretofore a stable anti-toxin has not been procurable to use in such cases. Amongst the discarded remedies may be mentioned chlorate of potassium as worse than useless internally and of little service locally. Sulphur insufflations, if applied thoroughly, though of more service, are difficult to disseminate completely over the affected area unless it be only upon the tonsils, is even then of less utility than other remedies, and is dangerous if blown into the larynx as sometimes happens. Jensen's crystal pepsin, lactic acid, tannic acid, and many other local applications have been given trial and proved of little if any value. This being the case what remedies have we left that can influence this serious disease. The writer is not fully prepared to believe that the disease is always local at first, although he is inclined to that view. But whether it is local first and constitutional afterwards or whether the local disease is but the manifestation of a constitutional disease, experience proves that the constitution should be supported from the start. Even if it is a local disease at the start, the constitutional symptoms often manifest themselves very early and should be forestalled by treatment.

In alcohol we possess a powerful remedy against this constitutional invasion. It should be given early, freely and continuously throughout the disease and well into convalescence. The writer's plan of treatment for a child of two years of age is as follows: Locally apply on a camel's hair brush with a bent handle a solution of equal parts of tinct. ferri chlor. and glycerin every six hours. Every hour spray for five minutes with a solution of equal parts of peroxide of hydrogen and water, using a rubber spray

producer, (metallic spray producers obviously will not answer, as they quickly become clogged by oxidation of the metal). Little ones soon become accustomed to the spray, and even, because of the comfort it gives, seem to like it. Internally, give eight drops of the tincture of iron in twenty drops of alcohol, diluted with syrup and water, every two hours night and day. Brandy or whiskey may be substituted for the alcohol, but double the quantity should be given. For older persons the iron and alcohol should be increased proportionately with age, and if weak or debilitated additional alcohol should be added on that account. Nourishment should also be given at regular intervals day and night, at from two to four hours apart. Milk and raw eggs are undoubtedly the best form of nourishment, but rare meats, fish and fruits may be freely taken. Sweets and starches are to be avoided.

If this plan of treatment is instituted at the beginning, laryngeal and nasal cases will seldom occur, and when they do occur the peroxide spray must be thoroughly applied to the affected parts. In addition to this it is well both for the patient and his attendants, that a solution of a fluidrachm of creolin to the pint of water, be kept playing by means of a steam atomizer in the sick-room, if not all the time, at least every two hours.

Of five cases in foreigners, treated upon this plan during the last year, all recovered. Of sixteen native cases seen within forty-eight hours all recovered. Of ten cases seen after forty-eight hours six recovered under alcohol and iron alone without the spray. Four succumbed.



A CASE OF ATTEMPTED SUICIDE.

By EDGERTON H. HART, M.D.

An interesting case of attempted suicide was brought to the Wuhu General Hospital shortly after midnight on the night of February 21st, 1897. The victim, a man of 48 years of age, a native of Wuhu, formerly belonging to the merchant class, but reduced by constant use of opium till he has now to number himself amongst the coolies and a poor one at that, as his average daily earnings do not amount to over fifty cash, owing to his inability to work for any length of time without resort to the opium den for frequent séances with his favorite drug. His average daily consumption of opium has been about three drachms, costing in the neighborhood of two hundred and fifty cash.

Having pawned all his household goods and clothing, saving the few tattered rags with which he was covered, and having nothing wherewith to pay for more opium, credit at the dens being impossible, as he was considerably in their debt, his wife being a victim of the habit as well, he became

desperate, concluded that the best way to rid himself of financial obligations would be to take three drachms of opium at once and gather himself unto his fathers, thus ending his unhappy existence. He took the drug early in the afternoon of the 21st. As the opium did not seem to have the desired effect he decided that the next best thing to do would be to jump off a bridge and drown his sorrows in the neighboring stream. His friends, becoming aware of his intentions, followed him to the stream with the idea of preventing him from drowning himself; they reached the stream in time to rescue him from the water. Night coming on he concluded to wait until his family should retire before making any further attempts. At ten o'clock, all in the house appearing to be asleep, he decided to make the last effort to get out of this unhappy world by drawing a razor across his throat. With one stroke of the razor's blade he laid open the larynx, exposing to view the vocal cords, the epiglottis, etc. The thyroid cartilage was badly shattered on the right side, necessitating the removal of a portion in order to repair the larynx properly. When he was brought to the hospital he appeared to be in a dying condition; his pulse was barely perceptible at the wrist, small and very feeble, due to the loss of a large quantity of blood which had been spurting from several branches of the superior thyroid arteries which had been cut.

Upon examination I found that the patient had cut through all the muscular tissues on each side of the neck, exposing the deep vessels without injuring them in any way. The wound was three and a half inches in length. We cleaned the patient up as best we could by lamp light, stitched the larynx with catgut, the muscles were united with catgut sutures and finally the external wound was sutured, a dressing of iodoform powder, sterilized gauze, and absorbent cotton was applied. The man was breathing freely, pulse had improved, due to stimulation of whisky and strychnine; he was then put to bed.

During the night he became insane, tore off all the dressings and pulled out the sutures one by one. When we were called to see him we found that the good work of the night would have to be done over again. The man was once more placed upon the operating table, and the work of repairing the larynx, etc., was done as before with many interruptions by our patient, who was almost unmanageable. We did not administer anæsthetic, as he was in no condition to stand it. Having finished our work for the second time the patient was again put to bed, but had to be carefully watched and fed, as he did not recover from his mania for several days. His recovery was rapid and uneventful. His voice is good, but rather husky. He quit the opium habit while in the hospital and went out a cleaner and wiser man.

I might add that I have found the above method a good one for curing opium fiends of their pernicious habit, as three cases of cut throat (all frequenters of opium dens) have been cared for by me, all of whom have been cured of the injury as well as the opium habit.

POISONING BY NAPHTHALIN.

By J. A. OTTE, M.D.

On May the fifth, 1897, wishing to prescribe naphthalin to one of my patients, I obtained eight grains of the drug from one of our local apothecaries. The bottle from which it was taken was clearly marked, "Naphthalin. Dose 5-15 grains". It was carefully weighed out in my presence. The drug was in the form of a white crystalline powder, and seemed pure, but having some doubts on the subject, I decided to take a dose myself before administering it to my patient, a very weak anæmic woman suffering from chronic enteritis. I took the eight grains in a wafer at about 12.15 p.m. Soon after reaching home (about one o'clock) I was seized with severe colicky pains in the abdomen, followed almost immediately by diarrhœa, tenesmus, and strangury. The motions were very numerous and small. At first they were fecal, but finally mixed with a great deal of mucus. The pain on micturation was most distressing. Thinking that I was suffering from an attack of dysentery, I took half an ounce of castor oil and washed out the rectum with water. At three o'clock the discharge from the bowel suddenly ceased. In spite of this the abdominal pains continued, gradually changing into a continuous dull ache all over the abdomen. After a short time the pain became most severe in the hypochondriac regions, and thence radiating towards the back and bladder.

At four p.m. vomiting set in and continued at short intervals until six o'clock of the following day, when it ceased after swallowing several small pieces of ice. During all this time it was impossible to retain anything, not even a mouthful of water. The vomited matters consisted simply of the contents of the stomach, towards the last slightly tinged with blood.

At five o'clock Dr. McDougall gave a hypodermic of one-third of a grain of morphia. After this the pain became somewhat less severe, but still prevented sleep.

At three a.m. of the sixth (fourteen hours after taking the drug) the pain suddenly became most agonizing. It seemed as if a red hot iron was being plunged into the kidneys with every heart beat. This severe pain lasted some twenty minutes. During the paroxysm the pulse was very slow and almost imperceptible at the wrist.

The urine passed shortly after the paroxysm was apparently normal in quantity; reddish-brown; acid; sp. gr. 1014; and contained about twenty-five vols. % of albumen. (Estimated after standing twelve hours). It also contained a few blood clots, and abundance of granular casts, urates and mucus. The diagnosis was now made of probable poisoning by naphthalin.

causing a temporary inflammation of the whole of the digestive tract, and followed by acute nephritis.

A hypodermic of one-third of a grain of morphia was promptly followed by considerable relief. Further relief was obtained by three leeches applied to the lumbar region, over the right kidney, which, after 3.30 a.m., was the most painful. At six a.m. the pulse was forty-five, and weak. The temperature was normal. (The temperature never rose above normal.)

May seventh.—Spent a restless night; in spite of this the improvement was marked; the pain in the kidneys nearly gone. During the afternoon suffered from severe hemicrania. The urine was apparently normal in quantity; color, brownish red; acid; sp. gr. 1016; albumen about ten vols. %; granular casts, urates, and mucus decidedly less; no blood clots. At noon the temperature was 98, and the pulse 56. Still felt very weak.

May eighth.—Spent another restless night; pain scarcely perceptible; appetite good; urine normal in color; acid, sp. gr. 1020, only a trace of albumen, no casts. The urine contained two or three fibrinous clots looking like sago granules. At noon the pulse was 46, temperature 98.2.

May ninth.—Excepting a feeling of weakness the recovery was complete. The urine was normal in color; neutral, sp. gr. 1018, no albumin, or casts. Pulse at noon 68, temperature 98.2.

I would have reported my case before, but have delayed doing so until I could also send the report of a chemist on a portion of the drug which I sent to England. Below I append the report.

“Report upon a Sample of Naphthalene received from, etc.

I have made a most critical examination of the sample both as regards its physical and chemical characters. The sample fully answers all the tests that it should do, and in my opinion is normal in every respect. It is rather above the average pharmaceutical degree of purity, it is quite free from quinoline bases, and contains the merest trace of phenols.”

(Signed) W. CHATTAWAY, F.I.C.,
*Chemist to the Society of Apothecaries,
 Public Analyst for the Borough of
 Colchester and for the Parish
 of Hammersmith.*

In a private letter received from the same gentleman occurred the following paragraph: “I am not a medical man, but I would throw out the suggestion that in certain medical circles it is recognized that bodies of this character, particularly including the terpenes and naphthalenes, are liable to produce nephritis, depending of course on the idiosyncrasy of those to whom the drug is administered.”

NATIVE TREATMENT.

By H. A. RANDLE, M.D.

The two following cases of native "treatment," came recently under my notice :—

1. A little child of two years' old is strumous, and has inflammatory enlargement of the lymphatic glands of the neck. A native medicine man advises the following: "Catch a frog, and thrust a hen's egg down its throat," (so that the egg is completely imbedded in the living frog), "put this into the fire, and burn it; by the time the frog is well charred, the egg is done. This egg must then be given to the sick child."

2. A woman has a violent attack of vomiting, and is unable to retain or take any food. Some wiseacre prescribes: "Catch a badger, cut off one foot, roast this thoroughly and pulverise, which may be given to the patient to quiet her troubled stomach."

Relatives of both came to me for some further treatment, and the answers I gave them may perhaps be open to some criticism, but I will venture to tell the JOURNAL. To the first I said the frog was "a mistake, it is a very weak creature, you should have caught a tiger, and have thrust a goose-egg down his throat. This would have been much more effective one way or the other."

To the second I said, "Why don't you study the fitness of things, you must have made a mistake about the badger, you should remember that a female patient requires a female badger, and a young woman a forefoot; you very likely got a male badger, and a hind foot, a combination totally unfit for the purpose."

Of course I gave them some more appropriate medicine in each case.

 MEDICAL EDUCATION.

By PHILIP E. COUSLAND, M. B., C. M.

The scheme of centrally situated well equipped medical schools deserves our warmest sympathy, and yet for some of us, especially those in the southern provinces, its realisation is still in the distant future; and as linguistic, economic and geographical reasons render it impossible for men to go to schools in other provinces, it will be necessary for us to train our own students for years to come.

The need for trained men and women as I take it is two-fold :—

First and most important, to help in hospital and dispensary work. The better trained our assistants are the more work we can devolve on them and the more extensive our medico-evangelistic operations can become.

Second, to practice among their sorely afflicted fellow-countrymen.

The difficulties and disadvantages of busy medical missionaries teaching medical students are sufficiently obvious, and have been dwelt upon by Dr. Stuart and others in this journal. There is something, however, to be said on the other side.

1. As I have already said, it is the only plan for many of us yet.

2. It is extremely good for the teacher, who otherwise tends to get rusty in some branches of medical science.

3. It is a great help to the hospital to have the assistance of these young men in dispensary, consulting and operation rooms, and in the wards. Without them one's paid staff of assistants and nurses would be so large as to be a serious drain on the funds.

4. By admitting only well educated students and by having a course of six years or longer, (and we find here that our men, if paid a small salary the last years of their course, are very willing to stay for that time), a very fair medical education can be given and the excellent clinical opportunities in dispensary and hospital enable one to give them a very good clinical training.

5. Men so trained form very valuable assistants. They can also act as tutors to succeeding classes of students, thus saving one's time and enabling one to give a more thorough course. If they prefer to engage in private practice they will be not unworthy representatives of Western medical science.

And now as to text books. What we want is something less elaborate than those used at home. Dr. Kerr's invaluable publications have so far been on the right lines, elementary text books for elementary teaching. What we need now are more advanced works and yet not so full and detailed as are required in the medical schools.

Two separate sets would be out of the question. Perhaps we could meet the difficulty by issuing a series pretty well up to the home standard, in which the subject matter is so arranged, either by using larger and smaller type or otherwise, that the easier course for the hospital students would be distinguished from that of the school students. It is hopeless to get our men who have to help in hospital and dispensary work to get up large text books. The Chinese are much handicapped by their written language. With us the mere reading of the printed page in English is no effort; we can use all our mental energy in appreciating the meaning. With the Chinese a considerable part of the labour expended is in the mere reading of the character. I am constantly reminded of this in teaching and examining students. It is a serious handicap, and illustrates the necessity for students having a very thorough preliminary grounding in the written language and for the careful preparation of text books in easy and lucid style. I have been recently reading with my men a translation of a work on pathology, and the style is so obscure that frequently they can make neither head nor tail of it. This is due to the

slavishly literal way it has been translated, the English idiom being followed in the most confusing manner.

As there is now a good hope that the Terminology Committee will issue a dictionary of terms used in medical science before the end of the century we should proceed to at once consider our educational needs and the best way to supply them.

To promote discussion and facilitate some agreement being reached I propose as follows:—

The appointment of an EDUCATIONAL COMMITTEE to arrange for the preparation of an authorised series of text books.

To collect funds for their publication if necessary, as their circulation will be small and the books must be large and well illustrated.

To arrange for the translation of new terms.

To draw up a scheme of medical education in two grades.

First, in regular medical schools.

Second, for students trained in hospitals.

To appoint examiners in connection with both courses. In the second only written examinations will be practicable.

In addition I suggest that it would be an excellent plan if a suitable man could be set aside to act as translator of the text books and editor of a Medical Mission Journal in Chinese. He could be a teacher in a medical school and give half or more of his time to this work, or still better, have a man who will give his whole time to it. His support might very well be provided by the home Medical Mission Societies. He could also undertake the editorship of the China Medical Missionary Journal.



Translations.

SOME ACCOUNT OF THE APPLICATION OF THE UNDULATORY CURRENT IN GENERAL THERAPEUTICS*.

By Dr. G. APOSTALI, Paris.

The undulatory current, a recent addition to electro-therapeutics, has been the subject of a series of clinical and therapeutic researches made by us, of which we here give a brief account. Since 1896 we have sedulously and simultaneously compared its use both in gynecology and in general therapeutics. We have already connoted the results which we have attained in the diseases of women. At the present time we simply desire to make a synthetic statement of the contributions which the undulatory current makes to general electro-therapeutics. Our experience, although still incomplete and recent, is based on 48 observations which have been carefully made at our clinic by my assistants—M. Lacquerrière and M. Marquis. At this time we will give a *résumé* of the modifying action which we have been able to demonstrate in the case of nervous, painful, or trophic disturbances of various kinds in which we have used the new current.

OPERATIVE TECHNIQUE AND STATISTICS.

We have applied the undulatory current by two different methods. 1st. *The Hydro-electric Bath.*—The patient is placed in a bath-tub full of tepid water, the tub being made of enameled iron for the purpose of insulation. The electrodes are formed of rectangular plates of carbon, covered upon one of their faces with an insulating layer of hard rubber. These are movable, and can be easily changed according to the indications for the application of the active pole to the precise part upon which it is desired to obtain the maximum effect. The séances are usually held daily or on alternate days, and their average duration is from five to six minutes. With this method of treatment one is able to secure a sufficient degree of intensity, which may vary from fifty to one hundred and twenty milliamperes. Patients usually endure this intensity with comfort, for one can increase it without any abruptness, and one is able, moreover, to increase or diminish the density of the current by increasing or diminishing the number of plates in the free poles. This application is not generally followed by any marked reaction, except more or less fatigue which may be palliated by shortening the duration of the bath.

* From a paper presented at the International Medical Congress, Moscow, August, 1897.

2nd. *Local Application*.—This is similar to the ordinary application of the continuous current. The same electrodes will serve in both cases. They are the carbon electrodes covered with moist membrane. This application is equally well supported, but in regard to the intensity one is able to attain the same results with a weaker current than would be found useful under the same operative conditions in the case of the continuous current. Thus the average dosage which we have used varies between five and fifteen milliamperes. This current is at once electrolytic and oscillatory, and it produces simultaneously at the point of application two sensations, which are associated together; first, that of the continuous current at the point of contact, and afterwards that of the interrupted current; but infinitely more mild, more soft and less abrupt than in the case of the faradic current, thanks to the non-revertant electric wave and the sinusoidal curve which constitute the undulatory current according to Professor d'Arsonval.

We have given since the month of January up to the 1st of August, 1897, 330 Hydro-electric baths to 17 patients, and we have made 246 local applications to 31 patients. So in total there have been made at our clinic 576 external applications of the undulatory current. It is impossible for us with the actual state of our experiments, which are yet all but at their beginning, to state and to give proof as to which of these two methods of applications we ought to accord the precedence, and which of the two, with the same dosage, would have the greater efficacy. We ought to add, however, that we have found the bath to possess the most marked advantages from the many circumstances under which it will permit the utilization of the local action directly polar and principal, in association with a general action, supplementary and diffused throughout the whole body, which it has on account of the diffused source of the current from the water in the bath-tub.

Therapeutic Effects.

We do not claim that all of the results we may have published are positive and entirely conclusive, and we voluntarily pass over for the present, in this very abridged account, the incomplete results which as a study still require further clinical investigation. It is before all the element pain which to us seems subject to this new current, and there are also circulatory troubles, as well as trophic lesions, and the peripheral muscles, which it seems to us ought to be greatly benefited by its anodyne, sedative, and tonic action.

Pain.—This current acts altogether after the manner of a revulsive and by a sort of deep massage interstitial in character, the action of which closely approaches that of the faradic current. It is used, on the other hand, for its peculiar properties as well as that of the polar and interpolar action of the galvanic current; moreover the two associated actions produce an analgesic effect more or less lasting, which with us was rarely wanting. Wherever we

have used it, whether in muscular pain of rheumatic origin or in obstinate neuralgia with or without neuritis the response at the first séances was all but constantly favorable; the patients felt themselves better, suffering less pain, executing formerly painful movements with greater ease, seeing their former pains gradually lessening or disappearing. They affirmed in a word that the current gave them relief more or less constant from the painful and obstinate trouble which had for the most part resisted the classical prescriptions used in similar circumstances. Two or three séances are sometimes sufficient to produce marked relief, and it is well, in that case, to hasten and precipitate its effect by repeating it as frequently as possible;—daily,—and at the beginning by preference two times a day. One should avoid too prolonged séances, and also equally the application of too strong a current. One should usually content himself with the dose fairly well tolerated, and one takes the precaution to exactly apply the electrode to a surface sufficiently large to cover all or a portion of the painful part upon which it ought to be in exact juxtaposition. In the case of the limbs, for example, as a point of interest, if one would influence profoundly an articular surface, as that of the knee or foot, one would apply the two poles directly to the extremes of the same diameter of the articulation.

FUNCTIONAL, TROPHIC, AND CIRCULATORY TROUBLES.

Wherever long experience sanctions the benefits of the faradic current, wherever, in a word, whether in a circulatory trouble or in a lesion of the peripheral muscular system there was a demand for appropriate electric treatment, and in particular, faradic treatment, we have experimented with the undulatory current.

Although our experience is still insufficient, the responses obtained to the present are nevertheless sufficiently satisfying to permit us to affirm that the undulatory current is destined to become the best succeedaneum of the faradic current. More tolerable, less painful, and more active than the latter, it realizes a real progress in general electro-therapeutics, and it does not require more, in our opinion, to come into popular use than a convenient portable outfit for its application. In a succeeding and more complete memoir we will present the whole of our observations, and they will be thoroughly demonstrative. So it is sufficient for us at present to say that it is in simple circulatory troubles, sprains, sequelæ of fractures, in functional impotency, muscular and apyretic articular rheumatism, in peripheral muscular lesions, atrophy of one or more groups of muscles; wherever, in a word, its application has been regarded by us as judicious, we have obtained marked therapeutic results. Without desiring to claim for this electric method more than it can attain, and without desiring to make it a panacea proper to cure all ills, we content ourselves with affirming that the therapeutic benefits we have secured

are very speedy, and that there is great encouragement at the present time to try the experiment on a larger scale. We would mention on the other hand, the failures we have demonstrated in all the trials that we have made in the case of functional troubles directly tributary to diseases of the cord or nerve centers.

CONCLUSIONS.

In conclusion, the possible contributions of the undulatory current to general therapeutics we have proven to be equally active and important with those that we have already established in gynecology. The undulatory current possesses three principal properties which assure its precedence. 1st. it is a rapid and efficacious analgesic; 2nd. it is a powerful counter-irritant; 3rd. it is a very good excitant of muscular contractility. It possesses, in a word, the associated qualities of the faradic and galvanic currents; and it merits, by rights, to occupy a foremost place in electro-therapy.—Translated from the monograph by G. A. S.

CONGENITAL CATARACT AFFECTING SEVERAL MEMBERS OF ONE FAMILY.

Translated by E. RUEL JELLISON, M.D., Nanking.

On the 6th December, 1882, there came to my consultation room an exceptionally blooming, robust woman, from Hüttenberg, with her infant F. S. two months old. The pupil has never since the infant's birth seemed to be in perfect order. At my most carefully worded explanation, that the case was one of total cataract, but that it could be entirely removed by an operation, she broke out into the most extreme excitement and declared that neither she nor her husband would consent to an operation.

To my surprise she explained the circumstances as follows: She and her husband are both perfectly healthy people. F. is their seventh child. The first two born—both boys—were healthy and had good eyes, but the third child was affected with cataract. This third child was at $1\frac{1}{2}$ years of age, unfortunately operated with an unlucky result to both eyes by a late Vienna specialist; the blind boy, now seven years old, is at present in the Grazer Blind Institute. Under such conditions she can never expose another child to an operation. After this third child followed two boys and a girl, all with good eyes. The 4th—a premature birth—died at a tender age. The 5th was carried off by diphtheria and the 6th with some "abdominal disease." Now follows the 7th child F., as the second affected with cataract. The mother having been encouraged and reassured by other operators, in the meanwhile, brought the child F. to me for operation the 27th June, 1887.

F. differs essentially in his whole appearance from children with eyesight. He is very excitable, but has never suffered from convulsions. He not only

played with his fingers before his eyes, in the well-known manner of children born blind or becoming blind very early in life, but also fell into the most peculiar rocking dance-like movements, in which he gracefully held the edge of his apron in his hands—much as a ballet dancer would. Otherwise he was unapproachable, busying himself preferably alone. He defended himself by scratching and biting against any displeasing sociable approaches. His psychological condition was undeniably very different from that of other children.

11. VII. Left, Linear—extraction outward and downward under narcosis. A little lens material remained at the periphery, but there was a splendid dark pupil in the centre.

16. VII. The same operation on the right eye; but because of strong myosis, iridectomy was necessary. Cataract nearly entirely removed. Binocular non-inflammatory healing with the best optical results. Learning to see proceeded very slowly. At first one met with a certain opposition on the part of the child to all visual trials. Latterly before he was dismissed the hospital on 26. VII the little patient began to prize his vision to some extent. Later information was to the effect that F. remained still peculiar in his psychological condition. The latest report, for which I must thank the kindness of Dr. Seiplechner, runs that he has attained a very useful vision. Although he constantly goes with his hands outstretched before him, he goes alone very well, and is also in condition to bring up articles shown him, etc. He has not enjoyed any instruction, principally because of his peculiar unhappy psychological make up; he is unruly, stubborn, passionate and perhaps malicious. He suffers otherwise from advanced scrofula, so that a completely normal condition is scarcely to be expected.

From a medical standpoint I have also to bring forward that F's mother had four other children, and the last one, the eleventh, was the third one blind at birth from cataract. The eleventh, however, died very young. Soon after followed the death of Mrs. S. in a gynecological hospital. The father also died soon after. The only information I could obtain from him was that he suffered once from a light skin eruption.

Finally we find among eleven children of one couple, three affected with complete congenital cataract, the 4th, 7th and 11th. None had suffered from convulsions; both parents had good eyes.—PURTSCHER in *Centrallblatt für Augenheilkunde*, July, 1897.

A FAMILY WITH JUVENILE CATARACT.

In the July number of this *Centrallblatt*, Dr. Purtscher published a report of a family in which three children of one mother were afflicted with complete congenital cataract. This has caused me to report concerning a family where all three children of a still living healthy mother became blind in both eyes of complete cataract at about the 20th year of age—the cataracts

developing in a few months. The father of these three patients died of lung disease at 40 after a long illness; the mother is living and healthy, and has especially good eyes.

The father, on the contrary, must have suffered from poor eyes in the last years of his life. Still he must have seen so much up to the time of his last illness that he could work.

During his illness his eyes became very bad, and he was informed that later an operation on his eyes must be expected.

This couple had six children. One girl died at seven from a fall. Another died at thirteen, the brothers not knowing a cause for the death. A third child died at two, having had an eruption on the neck and ulcers on the arm, which had developed in conjunction with vaccination. The deceased children are the 1st, 3rd and 6th. The eldest living brother, Julius P., shoemaker, aged 31, was run over by a waggon in his youth. The vehicle passed over his abdomen, and the patient remained away from school 14 days. He can recollect no other sickness, above all having never had convulsions. Formerly he had excellent vision, and was drafted into the army, but because he was a supernumerary he did not enter the ranks. He noticed, in his 26th year, when he wished to shoot again, that he saw dimly with the right eye. This caused him to consult an ophthalmologist, who informed him that he must undergo an eye operation. During the next half year the opacity increased so much that the eye became completely blind. Patient had right eye operated. A small amount of disturbance had at that time already developed in the left eye. Still after the operation, although he could see very well with his cataract glass, he worked another year, using the left eye. At this time the opacity had progressed to such an extent that he could no longer use the left eye for work, but was compelled to use the cataract glass. When the patient came under my care this eye had been blind for two years.

The youngest living brother is a tailor, aged 23; had never been ill as a youth, and had always seen very well. His sight was tested while attending the advanced school, and he had the best vision of all the pupils. On account of bodily weakness he was delayed one year from entering the army. In the course of this year he noticed that his right eye was poorer, and for this reason he came to my office in September of that year with the definite remark that the sight of the right eye had been dim for eight days. Upon examination I found delicate opacities in the lens within the pupillary region. The other eye was perfectly clear. The patient was at once told that these opacities were in all probability of an older date, and that they had only now been clearly made out. This seemed all the more probable, as his brother, whom I did not know at that time, was, according to patient's information, blind from congenital cataract.

In this conception I was soon of another mind, because these opacities increased so rapidly in a few weeks, and the collection of a more exact history of the brother's case, taught me that he did not have a congenital cataract. Within two months the entire lens was changed into a homogeneous gray mass. In this stage I proceeded to an operation which was especially easy, because the entire lens consisted of a grayish pulp. During the time of my observation the lens of the other eye began to become opaque, and in a few weeks after the operation the second eye could be operated. The patient retained perfectly round pupils, and with suitable glasses obtained full vision. He worked again as a tailor, could do as much work as his fellow-workers. The third brother Joseph, aged 26, had had swelling of the cervical lymphatic glands and ulcers of the toes in conjunction with vaccination.

At four he was already troubled with his eyes. He had at that time the eyes bound up for a long period. After this disease he had again seen tolerably and reached the first class in school, although during the time of attendance at school he was often ill and suffered constantly from lymphadenitis. After leaving school he returned home, and until eighteen managed the establishment of his parents. Then in a short time, without any perceptible external inflammation, went completely blind.

The first had returned home after the operation, and I had requested him to look at the eyes of the third brother a little more carefully. He informed me that it was the same with his brother as with himself. The pupil was changed into a round gray spot, and all he could distinguish was day and night and the light of the window. Accordingly it is in the highest degree probable that this brother, who formerly had suffered from scrofulous inflammations of the eyes, at 18, without external inflammation, had become blind from cataract in the same manner as the first brother.

It occurs very rarely that anyone without demonstrable cause becomes blind in both eyes from cataract at the 20th year; but how much more rare is it for all three members of one family who reach this age to go blind from a variety of cataract which leads to complete opacity of the lens in a few months.

In the two patients operated on by me, in spite of repeated examinations, neither sugar nor albumen could be found in the urine, nor any other general disease which could be brought into casual relation with cataract. Also in the interior of the eye, which was easy to examine, no change could be demonstrated which could be made responsible for the development of the cataracts. Any common injury can be excluded, as for instance disturbance brought on by naphthalin, because the brothers at the time of the development of the cataracts lived widely removed from each other. We must admit that there was a congenital disposition present in the family toward the early development of cataract, particularly as the father who died at 40 suffered also many years from early cataract.—SCHANZ in *Centrallblatt für Augenheilkunde*.

Selected Article.

APPENDICITIS; WHEN TO OPERATE AND HOW TO OPERATE.*

BY PARKER SYMS, M.D.

Appendicitis may be defined as a disease more or less widespread, which has its origin in an inflammation of the appendix vermiformis.

It may be limited strictly to the appendix, or it may involve the neighboring peritonæum.

It may result in a general peritonitis, or in general peritoneal sepsis, or in general septic poisoning by infection through the neighboring veins.

It is not within the scope of this paper to go fully into the pathology of appendicitis. I shall merely outline the various conditions which obtain in the different forms of the disease, and then set forth what my experience has taught me as to the best plan of treatment in a given case.

All cases of appendicitis I classify under two heads: First, benign; second, malignant. These may be subdivided thus:—

BENIGN.

Acute, Primary.

1. Simple catarrhal, with or without concretion.
2. Parietal, involving all the coats.
3. Parietal, with local adhesive peritonitis.

Chronic.

1. Recurrent.
2. Relapsing, with concretion, stenosis, or foreign body.

MALIGNANT.

1. Acute suppurative, with local fibrino-purulent peritonitis, by extension or perforation.

2. Acute suppurative, with progressive fibrino-purulent peritonitis by extension or perforation.

3. Subacute gangrenous, with localized fibrino-purulent peritonitis.

4. Suppurative, with retro-cæcal cellulitis.

5. Gangrenous, with retro-cæcal cellulitis.

Fulminating: 1. Acute purulent, with perforation and general peritonitis or peritoneal sepsis. 2. Acute gangrenous, with perforation, general peritonitis, or peritoneal sepsis.

Any benign appendicitis may become a case of any of the forms of malignant appendicitis.

This is more frequently demonstrated in the recurrent and relapsing forms. The question is really one of degree of severity rather than one of variety of diseased condition.

It is my rule to *insist* upon operation in any one of the varieties which I have classed as malignant, and to advise operation in the recurrent and relapsing cases, unless there is some special condition of the patient which would contraindicate an operation on general principles.

In these cases I always operate between the attacks, and long enough after an attack to avoid operating through an infected and inflamed area.

Every acute case of mild severity may be treated expectantly with the hope of checking the disease before it becomes one of malignant type.

Any case in which there is not rupture or perforation of the appendix, and in which there is not purulent peritonitis, may completely recover.

This is true of cases with adhesive peritonitis, when there is a perceptible tumor; but it is not true of cases in which there is a periappendicular abscess.

*From the *N. Y. Medical Journal* of May 15th, 1897.

Now comes the important part of this subject—namely, how is one to determine from the clinical evidences of a case of appendicitis just what the local pathological conditions are? This is a most difficult problem to solve, for the symptoms are not always in keeping with the severity of the disease.

Many cases of mild appendicitis are attended by very severe symptoms; while many of the most grave cases give rise to very slight symptoms. This latter is particularly true of the most malignant type—namely, the fulminating variety.

In the beginning of such an attack, symptoms may be even less significant and severe than in a case of catarrhal or simple parietal appendicitis. There is no local peritonitis, no tumor, and perhaps the only symptoms will be pain and tenderness in the right iliac fossa, slight rise of temperature, and slight acceleration of pulse rate; in fact, the symptoms may clearly point to a mild attack until perforation or rupture takes place, and when severe symptoms first appear, it will be to announce a condition that is already beyond hope of cure.

In considering this question the physician will naturally be guided by his own experience; but he should always give careful heed to the lessons others have learned. It is very desirable that this subject should be regarded too seriously rather than too trivially. If a physician has been fortunate enough to have been limited in his experience to a number of cases of the benign type, he is apt to have formed the idea that all cases of appendicitis may recover without operation, and a patient with a malignant form of the disease is very unfortunate if he comes under the care of that man. Fortunately, there are to-day few practitioners so narrow-minded and ignorant.

The real danger in cases of appendicitis is that the operation shall not be done when necessary; and that an operation may be done in a case which

would have recovered if treated expectantly is not a matter of much importance, for if the operation be properly done, the risk to the patient is almost *nil*. In appendicitis the danger lies in the disease, and not in the operation.

It is of the utmost importance in acute cases calling for surgical interference that operation be done as early as possible. In a case of acute suppurative or gangrenous appendicitis the patient's chance of recovery is much greater if operation can be done before perforation or rupture has taken place, even if protecting adhesions are formed, and, of course, if these are not present when the breakdown comes the chance of recovery is very small.

I know of no question more difficult to decide than the one which presents itself in the early hours of an acute appendicitis—namely, is it the beginning of a benign case, or is it the beginning of a malignant one?

This is a question that can not be answered in many instances, for in the two forms the onset is the same.

In some cases the local and general symptoms are so severe or significant from the beginning that there can be no doubt that the case is one of a severe and dangerous type. But the converse of this is not true, since one can never predict in a case that has a mild beginning that it will not have a serious ending.

In such cases one can only decide on the proper plan of treatment by making repeated examinations, and noting the progress or regress of the disease.

As a general rule it may be stated that a patient that is not decidedly better at the forty-eighth hour than at the twenty-fourth is not going on to spontaneous recovery.

General practitioners frequently put surgeons to a great disadvantage by not calling them in consultation early enough to allow them the benefit of making an early and then a later examination, and thus com-

paring the conditions. Too often the surgeon is called upon to decide a one-sided question. He can work to better advantage for many reasons if he sees the case early. His judgment can be soundly formed, his knowledge of the case from its early stages is of importance, and, when operation does become necessary, it can be the better accomplished if it has been anticipated and prepared for than if it be undertaken on the spur of the moment, perhaps at night, and without time for the best arrangement of details.

A typical attack of acute appendicitis will have about the following symptoms: A sudden onset, usually beginning with abdominal pain, starting around the umbilicus, and becoming more or less general, and finally becoming most intense in the region of the right iliac fossa. This may or may not be attended by vomiting. Soon there will be slight elevation of temperature, about 100° F., and acceleration of the pulse rate to about 90.

The most characteristic symptom is tenderness, with its seat of maximum intensity at the appendix. There is always a change in facial expression, varying from a slightly anxious look to a well-marked Hippocratic face.

Muscular rigidity will soon be present, especially in the right rectus abdominis.

All these symptoms may be present to a greater or less degree in the mildest case of catarrhal appendicitis. In the most severe of all cases—namely, the acute gangrenous without peritonitis—there may be no symptom present before rupture save point tenderness, muscular rigidity and accelerated pulse.

After an acute case has progressed a few hours, if local peritonitis is produced, either the simple plastic or the fibrino-purulent, a distinct tumor will be present in the neighborhood of the appendix. This may be obscured by the rigid muscles.

No fixed rule can be laid down for deciding in the early stages between the mild and the severe cases.

No man is capable of deciding this question positively and correctly in all cases. Ample and widespread experience with the various types of the disease will give one a faculty of determining the nature of the condition which may almost be called intuitive.

An exact and true word picture of a given case of simple catarrhal in the first thirty-six hours might fully and accurately describe a given case of the fulminating type; but, to one properly experienced, an indescribable character of some one symptom, as the pulse or facial expression, may indicate a malignant process. Usually a catarrhal or simple parietal appendicitis will present a mild train of symptoms from the start, and under the proper expectant treatment will show marked improvement in some or all of the symptoms by the forty-eighth hour.

At this time, in the majority of cases of suppurative or gangrenous cases with local peritonitis, "tumor," pain, and vomiting will have ceased, and the evidences present will be as follows: Temperature about 100°; pulse about 100; muscular rigidity, tumor well marked, hard, defined, and increasing; local tenderness now over site of tumor. Facial expression more or less anxious.

A gradual abatement of these symptoms will point to a regression of the disease. A sharp rise of temperature and acceleration of pulse rate, followed by a sudden fall of temperature and a sudden decrease in the pulse rate, usually marks the rupture or perforation of an appendix into firm adhesions.

During an attack of appendicitis a sudden cessation of symptoms is always a bad sign.

A fulminating attack of gangrenous or suppurative appendicitis may have about the following symptoms marking three stages:—

First. The stage before perforation. Temperature, 103° ; pulse, 120, high tension, small volume; pain localized, severe, lancinating; tenderness exquisite; facial expression anxious, haggard; respiration, 30 a minute, costal variety; vomiting reflex in character. General feeling of severe illness.

Second. The stage of rupture, short in duration, sudden in advent. Temperature normal or subnormal; pulse, 80; pain gone; tenderness slight; facial expression much improved; respiration normal; vomiting none. General feeling of relief and recovery.

Third. The stage of general septic peritonitis or sepsis. Temperature about 101° to 102° ; pulse, 110 to 120, small and weak; pain severe, general abdominal; tenderness, general abdominal with maximum at appendix; facial expression Hippocratic; respiration costal, rapid, irregular; vomiting may become stercoral. Great exhaustion and prostration.

Finally, collapse and heart failure will close the scene.

It must be borne in mind that a fulminating case may cause death by peritoneal sepsis without the production of septic peritonitis.

It is most unfortunate that no well-defined rule can be given for determining which is a benign case and which is a malignant one. This has to be decided by one set of symptoms in one instance, and on entirely different grounds in another. In one case the character of the pulse is most important, in another the temperature may decide the question, but usually one must judge by the patient's general condition, and by a careful study of all the symptoms, and of the relation of one symptom to the others.

Concerning the treatment of appendicitis the cases may be classed in three groups:—

First. Those in which operation is unnecessary and in which expectant treatment should succeed.

Second. Those in which operation is advisable and justifiable, but in which delay may not do harm.

Third. Those in which operation is imperative, and is the only safe method of treatment.

The first group is limited to the cases of primary catarrhal and primary parietal appendicitis without suppuration and without gangrene.

The second group embraces all cases of recurrent and relapsing appendicitis.

The third group embraces all the forms of appendicitis which I have classed as malignant—*i. e.*, all cases of suppurative or gangrenous appendicitis with periappendicular abscess and the fulminating type.

Before leaving the first group, let me set down briefly the proper method of expectant treatment:—

Put the patient to bed and keep him there. Apply over the whole of the right iliac region a soap "poultice," consisting of a thick layer of green soap spread on a single thickness of muslin or sheet lint.

Over this apply a broad ice bag—better still, an ice coil.

Relieve the bowels by a soap-and-water enema.

Keep the stomach at rest while vomiting exists.

Restrict the patient to milk, if he can take it; if not, give him clear broth.

Note the temperature, pulse, and respiration every four hours.

Give no drugs.

Never give opium or morphine in cases of appendicitis, except in case of abdominal shock from rupture of appendix or abscess.

Any case that does not improve under this plan of treatment will be found to be of one of the severer types.

The operative procedures may be described pertaining to four classes of cases:—

First. Cases of recurrent and relapsing appendicitis, without acute local peritonitis between attacks.

Second. Cases of acute, suppurative, or gangrenous appendicitis with local peritonitis, with or without periappendicular abscess.

Third. Chronic cases with persistent sinus.

Fourth. Fulminating appendicitis with rupture or perforation and general peritoneal involvement.

There are certain general rules which apply to all of these forms of operation. I shall touch on those at once, and then take up the special indications and procedures.

I always insist upon having one of my own assistants when it is possible to do so. I consider that the man who has charge of the protecting sponges and packings is of more importance than the one who does the operating.

I also prefer to have a nurse who has been accustomed to my method of operating.

The entire abdominal surface should be sterilized as completely as possible.

A proper operating table is very necessary. The Trendelenburg posture should not be used.

Hand sponges and flat laparotomy sponges should be made of sterilized gauze. For catching and removing the pus, I use very small marine sponges on holders.

The patient should be slowly and carefully anesthetized. This is very important.

A careful final examination should be made when the patient is thoroughly narcotized and the muscles are relaxed.

The operation should be done deliberately and carefully, but with all compatible speed.

We shall now take up the special form of operation:—

First. For relapsing and recurrent appendicitis without acute local peritonitis.

The propriety of operating on these cases must depend on the nature of the attacks, the frequency of the attacks and their severity, the amount of disability they cause the patient,

and the patient's condition of general health—that is to say, whether he is a fit subject for an operation or not.

In a patient of good general health and vigor this operation is free from danger.

After the patient has been thoroughly anesthetized, the skin properly prepared, the whole operation field properly protected by sterilized coverings, and the final examination made, the operation is done as follows:—

An incision is made down to the external oblique muscle. In a thin subject this incision may not need to be over an inch and a half in length. It must correspond to the thickness of the abdominal wall. It should be in a direction parallel to the fibres of the external oblique. Its middle point should be on a line drawn from the umbilicus to the anterior superior spine of the ilium. It should be external to the rectus muscle.

Next, the external oblique should be opened, by separating its fibres, not cutting, as far as the full length of the above incision. With this wound carefully held open the internal oblique should be cut, not split, in the same direction as the wound. The transversalis is divided in the same manner.

When the peritonæum is reached it should be lifted by two mouse-toothed forceps and divided, such care being taken as to positively insure against wounding the intestine, whether there be any adhesion or not. Of course, before opening the peritonæum all bleeding should be arrested and the wound thoroughly dried.

When the peritonæum has been sufficiently opened the index finger is introduced and the region of the appendix explored. If many adhesions are found, the entire wound should at once be so enlarged that the necessary separating and dissection can be done with facility and in plain view.

If this is not the case, the appendix should be sought for, and, if it be free,

its tip should be brought out of the wound. Then, as you come to its mesentery, it should be ligated with fine catgut and divided. The mesentery will require one or several ligatures, according to its width.

When the appendix is separated from the intestine, except at its base, it and a portion of the intestine should be brought out of the wound, so that the ablation can be done extraperitoneally. I pass the appendix through a hole in the centre of a flat sponge, so that a very small surface of the intestine is exposed.

I prefer Dawbarn's method of closing the intestine, which is done as follows: A purse string suture of fine silk is passed completely around the base of the appendix, about a quarter of an inch from the orifice of the appendix, involving only the peritoneal coat, the ends left untied.

The appendix is now cut off about half an inch from its base. Its canal is now probed to see if it be pervious. If not, it is made so by means of a small cautery point, and next the divided end of the appendix is grasped by a fine thumb forceps and pushed into the bowel by a complete invagination. The silk suture is now half tied and drawn tight. As the forceps is withdrawn the closure is complete and the full knot tied.

If all this has been carefully and satisfactorily done there will be no infection. The wound may be closed at once.

I close the wound by a single row of silkworm-gut sutures passed through the entire wall. Simple pad dressing.

I do this operation as an aseptic one, using no fluids after the final cleansing. The operation will take from fifteen to twenty minutes to perform.

I do not believe in McBurney's method of splitting both the internal and external obliques. It necessitates a larger wound, and it requires an unnecessary damage to the abdominal wall, for it means a tearing apart and separation of its layers. I strive as

far as possible to keep the various layers in apposition.

The after treatment of these cases is very simple—*i. e.*, fluid diet for four days; enema daily; stitches removed on the seventh day; first dressing removed on the seventh day; patient up and well on ninth to fourteenth day.

I never have a patient wear an abdominal supporter unless the wound has been unusually long.

Second. Operation for acute, suppurative, or gangrenous appendicitis with local peritonitis, with or without periappendicular abscess.

After the above described preparation of the patient and operation field, an incision is made similar to the one above described, but it must be extended at each end, and should be at least four inches in length.

The external oblique is opened by blunt dissection; the rest of the layers should be clean cut, and care should be taken not to separate one layer of the wall from another. If the aponeurosis and fascia are stripped bare they are very apt to slough, and thus leave a weak wall.

The essential part of this operation consists in the intra-peritoneal work in searching for and treating the abscess, if one exists, and in searching for and dealing with the appendix if there be no abscess.

The most important thing of all is the protection of the uninvaded peritonæum. This requires the exercise of sound judgment to determine how much to do, and of knowledge and skill to do it properly.

As soon as the peritonæum is opened sponge packing should be begun.

Throughout the operation this must be done in such a manner that no infected tissue nor disease product can come in contact with healthy peritonæum.

The first assistant must take entire charge of this.

When all the open spaces around the mass of adhesions have been completely closed by dry gauze pads, the

wound should be well retracted and the tumor gently entered by separating adhesions and by blunt dissection. When an abscess is reached I make a pin hole opening, and at once prevent the escape of pus by pressure of a small sponge held in an artery clamp. After a minute the sponge is replaced by a clean one and the pus is removed drop by drop, all of it being absorbed by these sponges and none of it allowed to escape into the wound.

After pressure is sufficiently reduced by emptying the abscess, the opening is gradually enlarged, and finally the cavity can be thoroughly sponged out.

Now it should be freely opened and its interior disinfected with hydrogen peroxide. The size of the abscess will depend upon the duration of the disease.

Its walls are composed of adherent intestines thickly coated with plastic lymph, and the ruptured or perforated appendix usually forms some part of this wall.

We have now reached the point when the average of the results will depend upon the judgment of the operator. If he is wise, he will remove the appendix in only those cases in which it can be readily found and removed without separating many adhesions. If he is rash, he will unduly persist in his manipulations, and in many cases he will break through Nature's safeguard at some point unseen and cause the death of his patient by secondary infection.

If the appendix can with safety be removed, it should be separated from the intestine with great care and gentleness, its mesentery properly ligated; then it should be ablated about a quarter of an inch from its base, and the canal thoroughly sterilized with the cautery.

Now a single ligature of catgut should be tied around the appendix, including all its coats, then the superfluous stump beyond this ligature trimmed away with the cautery or scissors. Now the operator should

thoroughly resterilize his hands, and all towels, etc., about the wound should be replaced by clean ones. One or two sutures may be used at each end of the wound, but an ample opening must be left, for the wound must be treated by packing.

Remember that in packing a wound for drainage you must not proceed as you would if you were calking a ship to prevent leakage.

These wounds, whether the appendix has been removed or not, should be packed as follows: One piece of iodoform gauze, folded longitudinally, is passed to the bottom of the abscess cavity and brought out of the wound, and turned to the outer side of the wound.

It should be large enough to completely fill the cavity, but not to stuff it. Now, as the first assistant slowly removes his gauze pads they should be replaced by pads of iodoform gauze which must be carefully protected from any contamination.

These pads must completely close any spaces where adhesions are wanting, and they must come in contact with healthy peritonæum and separate it from all infected areas.

Careful note must be kept of the number of pieces used. Now the entire wound should be covered by first a pad of iodoform, and then several pads of plain, sterilized gauze; flat ones are the best. These should be firmly held by strips of adhesive plaster. Over this a thick layer of absorbent cotton is placed and secured by an abdominal binder.

In case the operation is done before the appendix has broken down, and there is no circumappendicular abscess, the procedure should be the same as the one just described; but the appendix can be removed in nearly all instances.

The after-treatment of these cases is most important. It should be as follows: Complete rest of the stomach for twelve hours. Peptonized milk in small quantity after twelve hours, if there is no nausea or vomiting.

Patient should be kept quiet on his back for four days.

Enema of soap and water every day; if there is much tympanites, turpentine should be added.

The outside dressing should be removed at the end of twenty-four hours, and changed as often after that as it becomes saturated.

The packing should not be removed until the fifth day—that is, on the fourth day after operation.

This needs be done as carefully as the operation itself. Retractors should be used and the wound well opened.

Then the gauze should be removed from the tumor cavity. This should be thoroughly cleaned by dry sponging. No fluids should be used. Now this cavity should be carefully repacked, and then the protecting pads should be gently separated from the adhesions they have caused and new pieces substituted.

After this the wound should be dressed every third day. Soon a single packing will be sufficient, and this should be reduced in size at each dressing. The patient should be kept on fluid diet for one or two weeks, and be kept in bed until the wound is healed to a narrow sinus, which it will be in from three to five weeks. When the patient gets up he should wear an elastic binder for one year to prevent hernia.

No drug treatment will be needed. I insist on my rule concerning morphine. These patients will be comfortable and free from pain if they have not been reinfected at the operation, unless the case were already one of progressing peritonitis.

Third. Chronic cases with persisting sinus. Of this operation I shall write briefly. I make an oval incision which shall include the sinus; the next step is to enter the general peritoneal cavity at some point free from adhesions. Now the intraperitoneal dissection is begun, and the mass containing the sinus is slowly separated and pushed outward, while the healthy intestines are pushed to-

ward the median line, and ample gauze packing is interposed. The sinus will usually lead to a diseased appendix.

The entire diseased mass should be dissected and removed without opening the sinus or appendix, except, of course, when the latter is amputated.

The appendix stump should be closed by Dawbarn's method, and if the wound has not been subjected to contamination it may be closed by suture. If there be any doubt about this, it should be packed and drained.

Fourth. Operation in fulminating appendicitis, with rupture or perforation of appendix, with general peritoneal involvement.

This operation must accomplish removal of the appendix and of all infective material, and the cleansing toilet of the entire peritonæum.

When the diagnosis of this condition is positive, a large median incision should be made. The right iliac region should first receive attention. If the appendix is still attached, it should be removed and the stump secured. If the appendix has sloughed off, the intestinal orifice must be closed.

With one hand in the abdomen, a separate opening in this region should be made for special drainage.

Now every portion of the visceral and parietal peritonæum must be cleansed by thorough sponging, which shall remove all inflammatory products and all foreign material. After this is done, every portion of the peritoneal surface must be washed again and again with hot salt solution (6 to 1,000).

If the patient's strength will permit it, the intestines should be systematically, coil by coil, washed outside of the addomen.

The work *should* be done thoroughly; but it *must* be done rapidly, for these patients are always in a bad condition.

Often you will be obliged to be incomplete in your work to avoid death on the table.

After the cleansing is accomplished

gauze packing should be used so as to drain the entire abdominal cavity.

Enough suturing should be done to prevent escape of the intestines into the dressings.

A very large dressing must be applied externally; this should be changed in a few hours.

In these cases opium is called for to relieve the pain and as a stimulant

against shock. A full dose should be given before operation.

Acting in the main on the principles set forth in this paper, I have been operating in cases of appendicitis during the last eight years. Of five cases with general peritonitis I have lost three patients.

I have lost no other patient with appendicitis.



Medical and Surgical Progress.

THE TREATMENT OF OTORRHEA AND ITS IMPORTANCE.

Dench, one of the most progressive of modern otologists, has a paper with this title in the *Medico-Surgical Bulletin* of November 14, 1896. He first considers drainage and syringing, and asserts that while much has been written in favor of securing drainage by strips either of iodoform gauze or of some other antiseptic gauze, inserted into the canal as far as the *membrana tympani*, his opinion is that this procedure is not applicable in the majority of cases, and his experience has proved it to be so unsatisfactory that he no longer employs it. If these strips of gauze could be frequently changed, the measure would no doubt effect its purpose, but this is obviously impossible, either in private or hospital practice. He therefore prefers the old method of removing the discharge from the canal by the frequent use of the syringe, the irrigation being repeated as often as is necessary to keep the canal free of discharge.

Although it seems a very simple matter to syringe an ear, the operation is seldom done properly by the layman, and is not always successfully performed even by the physician. The fountain syringe is not adapted to the purpose, and either the ordinary piston syringe or soft-rubber bulb syringe should be used. As the removal of the accumulation in the canal is a purely mechanical process, a certain amount of force must be used in injecting the irrigating fluid. As the meatus is formed by two tubes, joining at an angle in both the horizontal and vertical planes, the deeper portion of the canal cannot be cleansed by a column of fluid unless these angles are obliterated and the axes of the two portions are brought into the same straight line.

This is effected by drawing the auricle upward, backward, and outward, during the operation; by this manipulation the fibrous meatus is made to conform to the direction of the bony canal.

It is also important to remember that the tip of the syringe must be introduced into the meatus, instead of being held close to its mouth. Care should be taken that the force applied in expelling the fluid from the syringe does not crowd the tip of the instrument against the walls of the meatus. The portion of the syringe introduced into the canal should be absolutely immovable, as otherwise the meatus may suffer from traumatism.

It is also to be borne in mind that in infants the bony meatus is absent, and that the inferior wall of the canal lies in contact with the superior wall. In order to convert this passage into a fibrous tube the walls must be separated by traction upon the auricle in the direction downward, backward, and outward, as in the adult.

The quantity of fluid to be used at each irrigation varies somewhat according to the character of the discharge. Usually half a pint is sufficient for the purpose of cleansing the meatus.

We are next to consider measures to secure asepsis. Given a serous or sero-mucous discharge from the meatus, no matter what its source may be, no further treatment is necessary to obtain a perfect cure than to prevent infection of this fluid as it lies in the external auditory canal. Frequent cleansing of its surface diminishes the chances of infection, but the danger is still further reduced if the cleansing fluid is antiseptic in character. It need scarcely be said that the syringe must be surgically clean, and that a separate receptacle should

be used for receiving the washings, instead of allowing the return current to flow into the vessel containing the irrigating fluid. This absurd error often occurs unless it is guarded against by giving special directions.

The fluid to be used is largely a matter of choice. Personally the writer prefers an aqueous solution of bichloride of mercury, 1 to 3000 or 1 to 5000. The fluid should be warm, but not hot, and the comfort of the patient is the best guide to indicate the correct temperature. Many other antiseptic solutions are, no doubt, as good as the one mentioned. Peroxide of hydrogen in these cases is, however, objectionable, although it is highly recommended by many authorities. The mixing of a solution of peroxide of hydrogen with a purulent secretion is followed by the evolution of considerable gas. The mere ocular demonstration of the activity of this agent, by means of the bubbles of gas which are seen to rise to the surface of the fluid as soon as the injection is made, in no way establishes its germicidal properties. The sudden liberation of a large volume of gas in the middle ear, where drainage is imperfect, is not free from danger, and for this reason the agent is contraindicated in these cases. Another objection is the irritation of the canal which the protracted use of the substance causes.

After cleansing the canal in the manner described, it should be maintained in as aseptic a condition as possible until the next irrigation. For this purpose each irrigation is followed by the instillation of a few drops of a dilute alcoholic solution of the bichloride of mercury, of a strength of 1 to 3000, the following mixture being the one the author usually employs:—

R Bichloride of mercury, 1 part;
Water, 1000 parts;
Alcohol, 2000 parts.

Under the use of these measures a serous or sero-mucous discharge will ordinarily cease, whether it be the result of aspergillus of the canal or of an acute catarrhal otitis media, either in a case in which the mem-

brana tympani was intact before the acute attack, or when this structure has been partially destroyed by a previous purulent inflammation. In other words, prevent infection from without, and recovery is prompt.

If the medical attendant is familiar with the use of the head-mirror, it is, of course, wise to dry the ear carefully at least once daily by means of cotton pledgets, and to apply the alcoholic solution, above mentioned, to the walls of the canal and to the membrana tympani by means of the cotton-tipped applicator. If the membrana tympani is largely destroyed, the same application should be made to the internal tympanic wall. It is hardly necessary to say that, in making such applications, the surgeon's fingers should be carefully cleansed, and that all instruments introduced into the meatus must be in an aseptic condition. It should also be remembered that under no circumstances is the canal to be occluded with cotton: the pledget soon becomes saturated with the discharge, and infection of the contiguous walls of the canal easily occurs. Powders should not be introduced into the canal to check an otorrhea; when mixed with the secretion they form hard masses which may firmly occlude the channel and prevent free drainage. The same measures should be applied in cases of purulent otorrhea, and will prove efficient in the case of furuncles within the meatus, preventing repeated infection of the adjacent parts of the canal.

In acute purulent otitis media the treatment suggested is the most advantageous, unless the surgeon can determine the exact local condition by speculum examination. The drainage in these cases is often imperfect, and free incision is necessary in order to secure relief. Until this can be done, however, the systematic irrigation of the canal, and measures for maintaining an aseptic condition of the region, are of the greatest value.

In chronic purulent otitis the same measures should also be employed. In these

cases, however, drainage is often imperfect, from the retention of secretion in the middle ear by the remnants of the membrana tympani or by the various reduplications of the mucous membrane lining the tympanic cavity. Here, also, free incision is necessary to secure a perfect drainage.

Again, the products of suppuration may be confined by the development of granulation tissue within the middle ear. In order to perfectly drain the cavity, this tissue must be removed either by means of the sharp curette or by the cold-wire snare. If the inflammatory process has exhausted itself, free drainage and asepsis will effect a cure. If, however, the process is still active, or if all necrotic tissue has not been evacuated, the discharge may continue, and the suggestions regarding treatment already given will merely reduce it in quantity. The author refers particularly to cases in which the bony structures within the tympanum are carious; this process may involve the ossicular chain alone, or may extend to the bony walls of the tympanum as well.

It is to be remembered that there is no such thing as "special surgery." The same broad principles which apply to caries and necrosis in other parts of the body are equally applicable to a similar condition within the middle ear. Every vestige of diseased bone must be removed before relief can be obtained. The exact procedure to be adopted must vary with the local conditions presented by individual cases. Where the caries is limited to the ossicles, and to those portions of the tympanum which can be easily reached by instruments introduced through the meatus, excision of the remnant of the ossicular chain and thorough curettement of the tympanic cavity will afford relief. Where, however, the process has extended further, and has invaded the most remote parts of the tympanic vault, and even the mastoid process, an intratympanic operation will not give relief, and some modification of the more radical procedure advised by Stacke (*Archiv. für*

Ohrenheilk., xxxi, p. 201) will be necessary.

The Stacke operation consists in detaching the auricle and fibrous meatus from the bony structures, and drawing the soft tissues forward, so as to expose the margins of the bony canal. The mastoid antrum is then entered in the usual way, and the partition between the canal and the opening in the mastoid is broken down, and the superior wall of the bony meatus removed by means of the chisel, thus giving free access to the tympanic vault and mastoid cells. Every vestige of diseased bone is taken away, the parts being under direct ocular inspection. The posterior wall of the fibrous canal is split longitudinally, and the flaps thus formed are turned backward into the bony cavity, thus converting the external auditory meatus, the tympanum, the tympanic vault and the mastoid cells into one large cavity. The auricle is then replaced, and the incision behind the ear sutured. All parts of this space can be seen by speculum examination through the canal, and, if all diseased bone has been removed, a satisfactory result can be confidently expected.

Which operation should be selected in any individual case depends, as before stated, upon the extent of the lesion. If properly selected, the simpler operation of removal of the ossicles and curettement of the tympanum gives results which are equally as satisfactory as those obtained by the more radical operation.—*Therapeutic Gazette*.

INDICATIONS FOR OPENING THE MASTOID.

Dr. Felix Cohn arrives at the following conclusions as to the indications for perforating the mastoid in acute and sub-acute middle-ear inflammations:—

1. The presence of hyperemia and congestion alone is no indication for opening the mastoid.
2. The mastoid should be opened in all cases of osteitis, if, under the usual antiphlogistic treatment, the inflammation shows no tendency to resolution.

3. In pronounced cases of antral empyema, in which the character of the discharge is purulent and the empyema shows no tendency to discharge completely through the middle ear.

4. In all cases of protracted otitis with profuse otorrhea, which show no tendency to resolve within a reasonable period, the time chosen for operation depending upon the manifest symptoms, whether, for instance, retention is present or the mastoid bone is itself involved.

5. In every case of acute otitis in which there are dangerous symptoms of resorption, and in which the drainage cannot be established by paracentesis or by the natural perforations.

6. In those cases, even without manifest symptoms of mastoid affection, the mastoid should be opened in order to produce a more favorable drainage, and to enable a thorough cleansing of the middle ear.

7. In all cases of muco-purulent otitis in which otitis is evidently maintained by mastoid involvement, the time for operation depending upon the condition of the patient and the presence or absence of symptoms pointing to retention or other complications of a serious nature.

8. In cases of mastoid disease, or otitis complicated by lymphangitis or lymphadenitis, in which there is imminent danger of the formation of an abscess, and in those cases in which the lymphadenitis does not tend to resolve under ordinary antiphlogistic treatment.

9. In cases of protracted otitis in which there are symptoms of serious secondary complications, involving danger of extension of the inflammation inward toward the brain, or downward toward the neck.

10. In cases of acute otitis, in which complicating stenosis of the external canal prevents drainage and thorough cleansing of the middle ear.—*New York Medical Journal*.

MASSAGE IN THE TREATMENT OF FRACTURES.

Woolsey (*Medical News*, March 20, 1897) concludes an article with the above heading with the following summary:—

1. The treatment of such fractures, especially those near joints, by immobilization, whether ambulatory or not, leaves something to be desired in (a) the time required and (b) the functional result obtained.

2. The treatment of such fractures by massage and passive motion shortens the time of bony union by one-third or one-half, and vastly improves the immediate functional result.

3. This treatment is especially applicable and important in fractures near joints.

4. Its application is easy. It relieves pain and swelling, hastens callus formation and solidification, prevents atrophy of the muscles and stiffness of the joints and tendons.

5. Splints should be applied between the daily fifteen- or twenty-minute applications of massage for the first ten or twenty days, according to the nature of the fracture and the tendency to displacement, or until consolidation occurs.

6. This treatment, combined with the ambulatory method, promises an ideal method.

7. Oblique fractures of both or the only bone in a limb, or fracture near the middle of the limb with a tendency to displacement, should be immobilized until consolidation has commenced.

8. The ambulatory treatment is indicated in the latter classes of fractures, in fractures of the lower extremity in the alcoholic or very aged, and in fractures of the neck of the femur in the aged.

9. The plan of immobilizing the limb for a short time in the best possible position, and then applying massage and passive motion, promises equally good results, and especially adapts the method to private practice, in which it is particularly indicated on account of the shortened time required for union and the excellent functional results.

THE PICRIC ACID AND ARISTOL
TREATMENT OF BURNS.

Dr. Cookman writes upon the recent methods of treating burns in the *Hahnemannian Monthly* for March, 1897. As he states there is perhaps no subject in the realm of surgery that has been so extensively written upon and discussed as burns and their treatment. Medical literature since time immemorial has devoted countless pages to this topic, and each current magazine seems to bring forward some new drug or plan of treatment that will produce rapid and painless healing of this injury. Yet burns will be burns, and still continue to pursue the uneven tenor of their way, producing ugly contracting scars and taxing to the utmost the skill and patience of the painstaking surgeon.

The two methods of treatment advocated in this brief paper, although comparatively new in this country, have been tried and their efficiency thoroughly proven in England and on the Continent. Powers of London and Thiery of Paris report a long series of cases successfully treated with picric acid; while Walton of Ghent and Von Kliegel of Vienna publish an equally extensive list of perfect recoveries under the aristol treatment.

Picric acid and aristol belong to that group of remedies which have recently been prepared by synthetical methods and introduced into therapeutics. The former, as is well known, is a product resulting from the action of nitric upon carbolic acid. It consists of fine yellow scales, soluble in water or alcohol, to both of which it gives a brilliant yellow color. Its use in medicine has been a limited one, while in commerce and the manufactures it has been extensively employed as a dye. As a local application for burns it is best used in the strength of one and a half drachms dissolved in three ounces of alcohol, and then diluted with two pints of distilled water. This makes the so-called saturated solution of picric acid.

The greatest advantages of picric acid in the treatment of burns are :—

1. The severe pain which is so characteristic of these injuries is considerably lessened, this being doubtless due to the carbolic acid of which it is largely made up, and which is a well-known local anesthetic.
2. It limits the tendency to suppuration on account of its strong antiseptic properties and the power it possesses of coagulating albuminous discharges. When we remember that the antiseptic carbolic and the coagulating nitric produce picric acid, these properties are readily understood.
3. Healing takes place rapidly under a scab, and the resulting scar is smooth and shows but little tendency to contract.

Picric acid is most indicated in superficial burns and scalds, with vesication of the skin, and should be applied as follows: After careful removal of all clothing from the burnt part, the wound should be cleansed as thoroughly as possible with the solution of the acid. If a syringe is used for this purpose the surgeon can avoid staining his hands. All blisters should be pricked and the serum allowed to escape, care being taken not to destroy the overlying epithelium. Sterilized gauze is then spread over the burned area and soaked with the lotion. A layer of absorbent cotton is put over the gauze and the dressing held in position by a bandage. This dressing may be left in place three or four days, and then gently removed by thoroughly moistening it with the picric solution, for it will be found to adhere closely to the skin. Subsequent dressings are similarly applied, and after three or four, according to the degree of burn, healing will be complete.

A word of caution is necessary. Picric acid is poison, fifteen grains being considered a lethal dose. We must therefore watch over patients for toxic symptoms. These are a general yellow color of the skin and conjunctiva, orange-colored urine, sexual excitement, mental lassitude, and gastric disturbances.

Aristol is a combination of iodine, iodide of potash, and thymol. It is a light red, extremely fine powder, insoluble in water and glycerin, slightly soluble in alcohol, and readily dissolved in ether, collodion, and the fixed oils. As a cicatrizant it probably has not the toxic and irritating character of the latter, is practically odorless, and probably has some anesthetic properties. When applied to a wound it produces at first a slight burning followed by a diminution of the painful sensations. Granulations spring up, healthy, vigorous, and vascular. Cicatrization takes place rapidly from the edges of the wound, and the scar seems to be less abundant in fibrous tissue, thus decreasing the liability to contraction.

Aristol may be used in all varieties of burns, from a simple erythema of the skin to a complete charring and destruction of the tissues. In the superficial form it is best used as a powder, while in the deeper burns the following ointment is to be preferred: Aristol, one part; olive oil, two parts; dissolve and add vaselin, eight parts.

Strict asepsis of the wound, however, is the first essential to success. After pricking all the blebs and permitting the serum to exude, the burn should be well irrigated with a weak solution of boracic or carbolic acid, and its surroundings scrubbed with soap and water. Then with sterilized absorbent cotton the surface should be gently dried, and the aristol applied, either as a powder, or an ointment. If the latter is used, the wounded edges are first dusted with the powder, and then sterilized gauze on which the ointment has been thickly spread is applied. The dressing is completed with another layer of gauze, absorbent cotton, and a bandage. After three days this should be removed, the wound and adjacent parts aseptized as before, and the same dressing reapplied. By careful treatment in this manner very extensive burns will rapidly cicatrize.

Although Cookman has described these two methods as separate and distinct, they may be combined.

THE TREATMENT OF ECZEMA.

In *La Médecine Moderne* for February 17, 1897, Besnier writes a long paper upon this subject in which he points out that it is indispensable in these cases to prescribe a particular diet and a regular method of life, if encouraging results are to be obtained in the treatment of severe cases. Care should also be taken that all internal and external causes for tracheal irritation are removed as far as possible, and the urine should always be carefully examined to see that there is no renal cause for the difficulty, as evidenced by albuminuria, phosphaturia, oxyluria, glycosuria, or polyuria, occurring in the course of such diathetic conditions as lithemia, gout, and diabetes. In regard to the methods of life Besnier points out that the patient should be as much as possible in the open air, must eat regularly of easily digested foods, the proteid constituents of which should be present in comparatively small amounts, and that fresh vegetables are useful, such as the various salads, cresses, and similar substances. Should the eczema be present in the new born great care should be paid to the regularity of nursing and the clothes, particularly the diapers; and as healthy surroundings as possible should be provided.

Purgatives have been much abused by the physicians of earlier times in the treatment of eczema because they have been given in excessive quantities, but their moderate use should constipation be present is an absolute necessity. At first calomel may be given in small doses, or some of the neutral salines or castor oil or the preparations of senna. As diuretics it is well to employ some of the alkaline mineral waters, and to use to a great extent a milk diet. Belladonna is sometimes useful in cases of eczema in which there is a profuse sero-fibrinous exudate. Under these circum-

stances two to ten drops of tincture of belladonna may be taken quite frequently, or in its stead small doses of atropine may be given. If there is a contraindication to these drugs we may employ such remedies as tannin, agaracin, and phosphate of sodium. In persons who have a distinctly malarial history quinine is to be employed both for its specific and general tonic effect, and antipyrin, colchicum, and digitalis may also be used, particularly if there is a gouty tendency or feebleness of the circulation. Strychnine is useful if there is marked circulatory feebleness. In the eczema of the young, which is often dependent upon anemia in lymphatic persons, the administration of iron is often exceedingly advisable; in other cases it is better to give cod-liver oil or the iodide of iron; or in some cases if there is a tendency to arteriosclerosis we may administer iodide of potassium with good results. If there is hereditary syphilis as an underlying cause of infantile eczema the iodide of potassium in moderate doses may be useful.

PRACTICAL WRINKLES IN THROUGH-AND-THROUGH DRAINAGE.

The following is applicable in any part where a through-and-through drainage tube is to be used.

The procedures were suggested and are particularly effective in overcoming certain difficulties in the maintenance of drainage in an empyema.

The first has reference to keeping the tube patulous by removing collections of pus and cutting off the granulations which grow down into the fenestra of the tube. It consists of an ordinary drainage tube with the requisite number of fenestræ, through the full length of which (previous to insertion) a strong silk ligature has been passed. This silk is of a length about four times that of the tube, and has fastened at about a tube's length from one end of it

either a split shot, the size of the caliber of the tube, or a section of rubber tubing. If a section of tubing is used (and this is more satisfactory) it should be of pure gum and just large enough to pass through the tube with some friction. The tube is inserted in the wound in the usual way and both ends are held with safety pins inserted in such a manner as not to infringe on the lumen. The two ends of the silk are knotted to form an endless string with the knot on the outside. When the tube becomes occluded, it is first moved in the sinus to cut off the granulations, and then the drag is pulled through the tube and everything in the form of pus is completely removed.

The second refers to the secondary or horsehair drainage. This consists of a strand of horsehair of the required thickness which has, at the proper distance from each other, two silk threads tied tightly around the strand with one end of each cut short and the other left the length of the drain. The strand is then cut squarely off at each end, one-fourth of an inch beyond the knotted silk. Then the knot and end of the strand are covered with sealing-wax which is shaped into a round probe and with the silk cord protruding from the tip. To insert the horsehair, the silk is attached to the silk of the drag, and the probe end is brought up snugly into the end of the tube. Then, as the tube is removed, the drain follows without giving extra pain. In case there is no cord in the tube, the silk of the drain can be threaded through a curved needle and the needle passed through the wall of the tube from within out. Then the end of the drain can be drawn up into the tube as before. After the drain is in place the two silk cords can be knotted. This will be found especially advantageous with children and nervous people; one quick jerk will remove the tube and locate the drain.—*Medical Record*, March 20, 1897.

DANGERS OF THYREOID.

In a case of catalepsy large doses of thyreoid apparently brought on an attack of exophthalmic goitre. The cataleptic had lain immovable in bed for over three years, all motor and sensory manifestations were absent, and feeding required the constant use of a nasal tube. The effect of increasing doses of the gland was a gradual return to the normal condition, so that he was able to speak and walk. When the dose of seventy-five grains a day was reached, symptoms of exophthalmic goitre developed, the pulse going up to 160, which required the temporary discontinuance of the remedy. After a few days the catalepsy returned and the treatment was again taken up, with the same results—disappearance of the cataleptic symptoms, but reappearance of the exophthalmic goitre. This latter, artificially produced in this manner, had all the characteristics of the true disease with the exception that there was no glandular enlargement, and that the symptoms disappeared whenever the dose of the remedy was diminished or it was discontinued. I conclude from this that Graves' disease is due to an overstimulation of the nervous system by products of the thyreoid gland, and that the administration of this gland as a remedy is injurious, the proper treatment being one tending to reduce the functional activity of the thyreoid gland.—HESSLER.

THE ABORTIVE TREATMENT OF ACUTE
CORYZA.

M. Courtade makes use of a siphon-douche to irrigate the nasal passages with saline solution at a temperature of 122° F., a pint of the liquid being usually sufficient. The jet must not be directed against the lateral wall of the fossa, for this will provoke a sensation or heat. A fall of three to four inches is sufficient for nasal purposes. In order that the irrigation may be suddenly stopped, if necessary, the tube

should be furnished with a cut-off. The higher the temperature, the smaller the quantity of fluid which will be necessary. Since it is the heat which is important, the choice between solutions of sodium chlorid and sodium bicarbonate is indifferent. Antiseptic solutions having a bactericidal action may be used. This method should be used with care, in order that an otitis media may not be set up.—*Bulletin Général de Thérapeutique*, 1897, 3e. liv., p. 90.

A CASE OF HÆMOPHILIA.

A boy sustained a wound in the region of the temple about three-fourths of an inch in length, and during two days various attempts were made to stop the hæmorrhage without effect. The boy was completely exhausted and feverish. I took from a vein in the arm of a healthy woman with a hypodermic syringe about a drachm of fresh blood, and injected into the bleeding wound; the foreign blood clotted in a short time, and the hæmorrhage was arrested after a light protective bandage was applied. The clotted foreign blood acted like an elastic tampon in all the interstices of the wound, or else the foreign blood supplied the particular ferment for thrombosis of the vessels which is deficient in the blood in cases of hæmophilia.—BIENWALD, in *Deutsche Medicinische Wochenschrift*.

PUTREFACTION OF PROTEIDS IN THE
STOMACH.

Though much attention has been paid to the fermentative changes in the carbohydrates which are met with in the stomach, but little study has been given to the abnormal fermentative or putrefactive process which occurs at the expense of the proteids of the food. Among the products of this process, hydrogen sulphide, H_2S , is not infrequently met with, and is particularly disagreeable because of its offensive odor. A case of this type, in which hydrogen-sulphide putrefaction was a prominent feature, has been carefully studied by Strauss (*Berliner*

klinische Wochenschrift, 1896, No. 18). Bacteriological examination of the stomach contents disclosed the presence of a germ corresponding closely to the characters of *bacillus coli communis*; it grew characteristically on gelatin and agar, produced gas and acid when grown in sugar broth, coagulated milk with production of acid, produced indol in sugar-free broth, and on potato formed a somewhat brownish, abundant growth. It was furthermore ascertained that *bacillus coli communis* regularly produces hydrogen sulphide in detectable quantity when grown in an abundant amount of ordinary agar or in peptonic water, and in peptonic broth in an atmosphere of hydrogen.

The symptoms of the case varied somewhat, and it was found that a peculiar relationship existed between the production of hydrogen sulphide and lactic acid formation. At the beginning of the illness, when the symptoms were severe, hydrogen sulphide was present in considerable quantity, but no lactic acid was detected; but later, when the symptoms had subsided somewhat, lactic acid was present, while hydrogen sulphide was not found. In seeking an explanation of this fact it was found that the addition of grape-sugar to the stomach contents undergoing the hydrogen sulphide-fermentation brought this quickly to an end, with a coincident abundant formation of carbon dioxide as the result of the fermentation of the sugar. This suggests, of course, that in the sugar the *bacillus coli* finds a more easily assimilable food than in proteids, and we have thus an explanation of the well-known fact that the administration of carbohydrates tends to lessen proteid putrefaction in the stomach.—*American Journal of the Medical Sciences*.

THE PHYSIOLOGICAL FUNCTIONS OF LEUCOCYTES.

M. Ranvier, at a meeting of the Academy of Sciences on February 22nd, read an interesting note on the role of the white

blood corpuscle in the organism. The note, which abounded in novel views upon the subject, was written mainly for the purpose of demonstrating that the white cell, or lymphatic cell, or leucocyte, contributes to the nutrition of the different organs of the body. At the beginning of the article he deprecates the use of the name *phagocyte* for these cells; because, as he says, this term would make it appear that the cells to which it is applied are of a new species, whereas they have long been well known and thoroughly studied under another name; and because all the cells in the body eat, as well as the so-called phagocytes. The leucocytes have other functions than that of phagocytosis and functions of much greater importance from a physiological point of view. The author has elsewhere shown that these cells are capable of fixing themselves in the tissues, of increasing in size and of acquiring a new form. In studying them in wounds of the cornea he has been able to demonstrate that they play an important part in nutrition. In preparations of the cornea made 48 hours after the wound the following conditions were found: the epithelial layer has advanced considerably over the lesion, leaving its center free, however, and the cells of this layer present the signs of very active karyokinesis. The central portion of the wound, as yet uncovered with epithelium, shows a great number of leucocytes. The majority of these present a double contour and contain several nuclei and have lost their chromatin. Often, too, the nuclei have been set free by the dissolving of the protoplasm of the cell, and the number of free nuclei is always in direct relation with the intensity of the phenomena of inflammation. The dissolution of the leucocytes brings to the proliferating epithelial cells the nutritive substances of which they have need, and which cannot be otherwise supplied them because there are no blood vessels present in these tissues. The phenomena of inflammation greatly resemble those of development of

the embryo. In fact, *inflammation reduces the tissues to the embryonic condition.*

TREATMENT OF GLAUCOMA.

S. O. Richey (*Annals of Ophthalmology and Otology*, October, 1896) states that he has not seen a case of glaucoma, acute or chronic, that did not have a history of gout, inherited or acquired; and lays down the following propositions as a guide to its management:—

1. When syphilis is the agent of causation, the indications are clear—antisiphilitic treatment.

2. Acute or chronic glaucoma of other origin finds its initial cause and beginning in the digestive tract.

3. A departure from the normal physiological processes in the digestive tract intoxicates slowly, progressively, and accumulatively both the vascular and the nervous systems, producing a degrading tissue-change in various organs; and interstitial ophthalmitis (glaucoma), an interstitial nephritis, etc., which may be precipitated into a violently active form by injury, exposure, a more than usually indiscreet meal, or by a severe emotional crisis.

4. That chronic simple glaucoma consists in a hyperplasia of connective tissue, involving ultimately the whole bulk, and cannot be cured by operation.

5. That the acute form is vascular in character, and may be engrafted upon the chronic form.

6. That to meet the indications on this basis we must begin with the beginning of the disease, and correct individual habits.

In the way of specific measures, Richey recommends in acute glaucoma the general hot bath, the use of a myotic with taxis of the eyeball, the prompt exhibition of colchicin, the hot bath repeated after several hours, if necessary, always keeping the patient warm after it; after gaining control

of an attack, prophylaxis, as in the case of chronic simple glaucoma; in chronic glaucoma, baths, always hot, several times a week, in a warm room, and immersing the whole body. The bath need not be hot enough (102° to 104°) or continued long enough to produce sweating. A weak myotic collyrium must be persisted in, with daily taxis for a few minutes, until the tension is normal and remains so. A mixture of sodium salicylate, ammonia, and taraxacum should be pushed to the point of physiological tinnitus; and continued as long as necessary, except suspending it to combat symptoms of irritable glaucoma that may arise, with colchicin, if it continues to act well. The intestinal tract must be soaked with hunyadi janos, three or four ounces being taken at bedtime, and repeated every night, perhaps in less quantity, until the stools become yellow.

STERILIZED WATER IN THE TREATMENT OF INFANTILE DIARRHEA.

Watu (*Thèse de Paris*, 1896—7, No. 40, ii) advocates the treatment of the above-mentioned disease by a regimen of boiled water, cooled to a suitable temperature, and given in small quantities every hour or half hour, or as thirst demands, to the exclusion of all food, for eight, twelve, or even twenty-four hours. This mode of treatment is a means of diluting the irritating secretions, dislodging the *débris* of decomposed alimentary matter retained in the folds of the mucosa of the canal; it also increases the pressure in the blood-vessels, and by dissolving the toxins attached to the formal elements, carries away and eliminates the poison from the system, changes the morbid character of the stools, and effects a reduction of the temperature and recovery, especially when administered in acute cases at their commencement, and in children not very strong.—*British Medical Journal*, April 17, 1897.

CHEMISTRY OF THE THYROID GLAND.

R. Hutchinson (*Jour. of Phys.*, XX, No. 6, pp. 474-496) states as follows:—

1. The thyroid contains two proteids—a nucleo-albumin and the colloid matter.
2. The nucleo-albumin is present in small amount, and is probably contained in the cells lining the acini. As far as it has been investigated, it does not differ from other substances of the same class.
3. The colloid is present in large amount, and is contained in the acini.
4. It contains a small amount of phosphorus and a considerable proportion of iodine.
5. It does not yield a reducing substance on boiling with mineral acid, nor can nucleic bases be obtained from it.
6. It is, therefore, neither allied to mucin, nor is it a compound of true nuclein.
7. Neither does it contain paranuclein.
8. On gastric digestion, it is split up into a non-proteid and a proteid part. This decomposition occurs very readily.
9. Both of these parts contain iodine, but the non-proteid much more than the proteid element. The former contains all the phosphorus of the original colloid.
10. The colloid matter may, therefore, be provisionally regarded as a compound proteid of peculiar constitution.
11. The ordinary extractives are present in the thyroid in fairly large amount. Whether any hitherto unknown amido-bodies are present among these must be left still undecided.
12. The colloid matter is the only active constituent of the gland.
13. Both the non-proteid and the proteid parts of the colloid are possessed of activity, but the former in much greater degree than the latter.

CLEANSING AND CLEANLINESS IN ABDOMINAL SURGICAL OPERATIONS.

Lawson Tait (*Medical Record*, Dec. 19, 1896) in an interesting paper on the above

subject, gives the following directions: First of all, if an operation such as the removal of an ovarian tumor has been conducted so well and so fortunately that nothing has entered the peritoneal cavity, the wound ought to be closed at once without sponge or anything else entering it. If, on the contrary, a mess has been made inside, it must be cleaned out; and the question is to decide on the best method, and the weight of argument should always be against the use of sponges—they are so inherently dangerous. Yet their use is often essential; thus, in separating adhesions of the omentum to a tumor nothing displays the ability and dexterity of a surgeon so much as the rapid folding up of a dry sponge in the damaged apron; or, if the adhesion of the appendages to the pelvic wall bleed freely, the pelvis must be packed, and the packing will probably remove much dirt with it. Until two years ago the author always used sponges for this purpose, and would often have six or eight sponges squeezed tight down in the pelvis; now he uses iodoform gauze for this purpose. Who it was who led us to make this important advance he does not know; but it is one of real value, for iodoform gauze stops oozing from parietal and visceral surfaces in a way that nothing else will do, save perchloride of iron. If, however, a ligature has cut through a rotten parietal, or a vessel has escaped the forceps and ligature and cannot be found, washing out with a stream of clean water will speedily display the source of the bleeding and enable the vessel to be secured. He does not combine the two processes if he can help it, for they do not generally aid one another.

As Tait believes that pus is a substance already dead and generally decomposing, he takes the utmost care to cleanse it all away, or anything which from his view more or less imitates it, such as loose blood-clot and blood in solution. The method to be employed in this case is the continuous

stream; the best way to serve this purpose is simply to reverse a stream of common tepid water through one of his ovariotomy trocars, and he uses a large one if he wishes to dislodge and wash out loose clots by means of a large volume of water issuing from a large tube; or, on the other hand, if he wants to wash carefully every inch of the peritoneal surface, he uses a small tube with a gently flowing stream. If the tubes are not handy—and in our worst emergencies, like ruptural pregnancy they may not be—a very efficient substitute, is to open the wound as widely as possible, pull up the parietals, and pour in with cautious violence one or more jugfuls of tepid water, insert the right hand in the abdomen, and with the left close the wound round the wrist as closely as possible. The process of washing may then be carried out as fully as is considered desirable. If a tube of the Tait pattern can be obtained, it is better to use it, for it can be carried into every one of the complex interstices of the peritoneum, and the washing be thereby made most thoroughly; but the inexperienced operator should be cautioned against using a double tube for entrance and exit, as has recently been recommended. This is no new proposal, and when such is used the stream does not get spread but returns at once, short-circuited, as the electricians say, and without doing much cleansing. Care must be used to have the temperature of the water not lower than 100.°

SUPERALIMENTATION IN TUBERCULOSIS.

Lorchet lays emphasis upon the fact that the food which nourishes and is suitable for a healthy man, is not sufficient for tuberculous subjects; they require superalimentation, which, being methodically administered, modifies and finally greatly exceeds the amount required for nutrition.

This principle, which was established by Debove, led to forced alimentation by gavage, and it has happened that patients attacked by unsurmountable anorexia have

in this way recovered their natural appetites. These not uncommon examples would appear to confirm the opinion of Debove that there is no relation whatever between the appetite of a tuberculous subject and the digestive power of his gastrointestinal juice.

In his work on the treatment of pulmonary phthisis Daremberg cites two recoveries obtained by forced alimentation, one being that of a young physician in whom the disease had reached the stage of softening and who was unable to take or retain the slightest food. Superalimentation by gavage not only enabled him to bear without any ill effects an exacerbation of the disease six months after the beginning of the treatment, but also to resume his practice under unfavorable climatic conditions, and to eat normally. His relative recovery was maintained in good condition six years later.

The second case referred to an hysterical phthisical patient who rejected everything she swallowed and who was emaciated to a skeleton-like degree. After five or six gavages she was able to swallow without the tube, and seven years later her recovery still persisted. At present gavage is no longer resorted to except in cases of necessity, such as uncontrollable vomiting and absolute anorexia. It is nearly always possible to overcome the disgust of the patients for their food by persuasion.

Meat-powder now forms the basis of superalimentation, as it can be administered by the mouth. Nutritious in small quantities and assimilable without fatiguing the digestive organs, meat-powder forms the aliment *par excellence* of the consumptive; whether given alone, by gavage, or mixed with various liquids, to patients unable to eat and consequently doomed to an early death, or administered in conjunction with their ordinary food to patients having a good appetite, meat-powder is the only substance which allows of an assured and methodical superalimentation.

In apyretic tuberculous cases the matter is very easy, and they can be given large

doses of powder. Debove, Grancher, and Bouchard have noticed surprising improvement under these conditions. Even in cases where the patients had vesperal fever, with tuberculous infiltration or even softening, Daremberg has several times seen superalimentation rapidly bring up the general condition and cause the disappearance of the cavernous lesions. As for the patients having a fever, and who must not be overfed, no food is better calculated to antagonize the losses which expose these unfortunates to an early death. As stated by Debove, "we know what the future has in store for the consumptive who ceases to eat. He is consumed by the fever; has sudorific, intestinal, and bronchial losses; while his receipts are *nil*, and his expenses exaggerated."—*La Médecine Moderne*.

THE TREATMENT OF CHILBLAINS.

Dr. F. W. Forbes Ross applies the secondary current of the faradic battery from five to fifteen minutes, increasing the current gradually to high strength, the poles being in contact with the affected area, having previously dipped the electrodes in a saturated solution of sodium chloride. The tissues are gradually blanched, commencing after about five minutes. The itching is completely and promptly stopped by the first application, and a second, one or two days afterward, usually suffices for a cure. Seldom, if ever, does a third or fourth application become necessary.—*The Lancet*, 1897, No. 3832.

MALARIA AND MOSQUITOES.

It has many times been suggested that flies, mosquitoes, and other insects are active agents in the dissemination of such maladies as cholera, yellow fever, and malaria; and recent studies by Dr. Bignani, of Italy, have developed some interesting facts which confirm this view. It appears from these experiments that malaria parasites are not carried by the wind, at least

to the extent generally supposed. If this were the case, they would be likely to be carried away by a good strong breeze blowing steadily for some days. If the mosquito acts in the capacity of a vaccinator, it is readily seen why the malaria parasite adheres so closely to given localities, since the mosquito avoids being carried off by the wind by hiding in thick grass, trees, and shrubs whenever the wind blows. The greater danger of contracting malaria through exposure to the night air is also thus explained. The mosquito is well known to be nocturnal in its habits. It always flies near the ground, never ascending to any great altitude in its flight. The dwellers on the Roman Campagna, which is a well-known malarial region, elevate their houses upon high pedestals. The writer once saw a cottage perched upon the top of an ancient mammoth tombstone on the Appian Way near Rome. In this cottage dwelt an Italian peasant with his wife and little ones, who required the services of a ladder nearly twenty feet in length to reach their melancholy dwelling.

It has long been known that persons dwelling in malarious regions are less likely to take malarial fever if they protect themselves from the bites of mosquitoes. A missionary friend dwelling in one of the most unsalubrious regions of Africa, where malarial fever is extremely frequent and malignant in character, in a letter not long since, expressed the view that malarial fever was sometimes the result of the stings or bites of ants.—*Modern Medicine*.

THE FUNCTION OF THE SUPRARENALS.

L. Szymonowicz (*Arch. f. Phys.*, lxiv, Nos. 3, 4) reports three facts which throw much light upon the heretofore obscure function of the suprarenal capsules. They are as follows:—

1. The extirpation of both suprarenals causes a decided diminution of the blood pressure; the pulse becomes smaller.

2. Introduction of suprarenal extracts into the veins produces, chief of all, a decided increase of blood pressure, and increase of the heart's action.

3. The blood flowing from the suprarenal veins, when introduced into the circulation of another animal, causes the same phenomena as do the suprarenal extracts when introduced into the blood, but in a lesser degree.

The author concludes from these researches and those of Cybalski that: (1) the suprarenals are organs of undoubted necessity to life, being glands with an internal secretion; (2) it is their duty (especially of the medullary substance) to produce and transmit to the blood a substance which continually upholds the activity of the vasomotor nerve-centers, the vagus and the accelerator nerves, as well as the respiratory centers, and, in all probability, the centers controlling muscular tonicity.

Dubois has shown that the principal function of the suprarenal bodies is to destroy toxins present in the circulation, especially those resulting from muscular and nervous activity. The glands contain a peculiar ferment which is capable of modifying organic poisons developed by the tissues or of bacterial origin. A considerable quantity of poisonous liquids is found in the glands.

COCAINE IN SURGERY.

The use of cocaine should not be abandoned because its irrational employment has produced deleterious results:

Always make a thorough physical examination of the patient before injecting the drug:

It should not be used in cases showing organic diseases of the brain, heart, lungs, or kidneys, or in persons of neurotic diathesis:

Children bear it fully as well as adults:

The patient should always be placed in a recumbent position prior to its employment:

Constriction should be used whenever possible to limit the action of the drug to a desired area:

Use a freshly prepared solution for each case:

Distilled water should always be employed, to which phenic, salicylic, or boric acid should be added:

A two-per-cent. solution has a better effect, and is safer than solutions of greater strength:

Never inject a larger quantity than one and one-eighth grains when no constriction is used:

About the head, face, and neck, one-third of a grain should never be exceeded:

When constriction is possible, the dose may be as large as two grains:

Every slight physiological effect is not necessarily to be taken as cause for alarm:

Cocaine does have effect upon inflamed tissues:

In case alarming symptoms occur, use amyl nitrite, strychnine, digitalis, ether, or ammonia.—*Clinical Journal* (London).

NEW TREATMENT OF LEPROSY.

I have treated two cases of leprosy by means of hypodermatic injections of corrosive sublimate. This had previously been accidentally given to a case supposed to be one of syphilis, and which after its true nature was revealed proved to have been greatly benefited. In the two cases just mentioned the dose given was one-fifth of a grain injected into the buttocks. As a result I believe mercuric chloride is worthy of further trial, as the improvement was very well marked in both cases.—CROCKER, in *The Lancet* (London).

SERUM TREATMENT OF LEPROSY.

This method, which originated with Dr. Carrasquilla, he has successfully employed in fifteen cases, and it promises to prove a panacea in this disease. The conclusions

from the cases treated are thus summarized in the *Indian Medical Record* :—

"1. The serum treatment overcomes the anesthesia more or less rapidly, in proportion to the extent and gravity of the lesions of the peripheral nerves.

"2. It decolorizes the macules without obliterating them entirely; they become the seat of abundant desquamation.

"3. It causes edema to disappear rapidly in some cases, slowly in others; the skin retracts, becomes wrinkled, and finally returns to its normal state when the edema has subsided.

"4. The tubercles become flattened and softened, and disappear, either by absorption, by desquamation, or by suppuration, leaving marks to show their situation.

"5. After suppurating abundantly, the ulcers heal with marvelous rapidity, leaving the skin sound.

"6. The scars of old suppurative leprodermata become pale, and tend to assume a level with the surrounding skin.

"7. The ulcerated mucous membranes hasten to cicatrize, become decolorized like the cutaneous macules, and regain their sensibility, while the tubercles disappear.

"8. With the disappearance of the edema and the tubercles, and with the fading of the stains, the countenance grows thin, and loses its leonine aspect entirely.

"9. The appetite is recovered, together with the capability of sleeping; there is cheerfulness and content replacing the previous profound depression, and lost hope is regained.

"10. From the first serum injection administered to the patient, the morbid action of the bacillus lepræ leaves, and no new manifestation of the disease shows itself."

MALARIAL HEMATURIA.

Summary of Treatment.

In the *Alabama Medical and Surgical Age* for August, 1896, Guice sums up his

treatment of this serious condition as follows :—

1. To control pain, restlessness, or other distressing symptoms, give hypodermically about a quarter of a grain of morphine, and repeat *pro re nata*, observing always that narcotism be not induced. Atropine is added to the morphine when indicated by the condition of the patient. The opiate is also vastly beneficial as a stimulant and regulator of the vaso-motor system.

2. Epsom salts should be given (particularly in the early stage) in full doses about every four hours until about six copious evacuations are obtained. Subsequently the bowels should be moved daily by the use of smaller doses of the salts. The active purgative effect produced by the magnesium sulphate is rationally one of the most important adjuncts to the treatment. The vigorous osmosis thus set up in the alimentary canal constitutes a valuable factor in relieving the congestion of the kidneys by lowering the vascular tension, and thus assists in controlling the hemorrhage. And the same osmotic action of the salts relieves the hepatic engorgement; in fact, all the organs supplied by the portal system are thus relieved or largely benefited. The purgation also tends to relieve the nausea and vomiting and otherwise to assist in placing the alimentary system in condition to retain and assimilate both food and medicine.

3. Turpentine is given early in the attack in the dose of ten drops every three or four hours, and continued till the urine is clear and the patient beyond the period of danger. It is an axiom with those best acquainted with malarial hematuria, that the oil of turpentine is by far the best remedy for the renal hemorrhage. And, aside from its hemostatic action, turpentine is a reliable diuretic, and thus renders additional service in preventing the suppression of urine. It is also a valuable vaso-motor stimulant, and thus fills another important indication, especially in the graver types of the disease.

4. Tincture of chloride of iron and solution of arsenic are given in combination, and operate to improve the condition of the blood and tone up the failing vital forces. The arsenic also acts specifically to counteract and destroy the germ of malaria. Eight to ten drops of the iron and two to three of the arsenical preparation should be given every three to four hours, and continued until convalescence is fully established.

5. In malarial hematuria the patient cannot be considered free from disease or exempt from relapses even after he has reached the stage of advanced convalescence. In truth, he is then, in most cases, only restored to the condition of malarial cachexia, with such additional damage as may have resulted from the exacerbation which precipitated the hematuria. Unless the patient receive proper treatment at this stage, he will continue in a state of malarial cachexia or probably suffer a recurrent hematuria. In all cases, therefore, the patient should remain under the care of the medical attendant, avoid exposure and violent exercise, and have nourishing food and comfortable clothing; above all things he should continue, for not less than thirty days, such treatment as is best adapted to the cachectic condition. Guice has used with unfailing success, in such cases, a combination of iron, quinine, and arsenious acid. The formula given in the case reported is a good one. Should the patient be unable to take pills or capsules, the following combination will be found effective:—

R Quininae sulphat., dr. j;
Tinct. ferri chlorid., f. dr. v;
Liq. acidi arseniosi, f. dr. iss;
Potass. chlorat., dr. j;
Syr. zingib., q. s. ad f. oz. iv.

M. Sig.: Teaspoonful in water thrice daily, after meals.

The foregoing treatment will prove effective, for this stage, in almost all cases, if strictly carried out for a sufficient period. And it is only reasonable that time should be required to correct the structural lesions existing in the spleen, liver, kidneys, etc.

The same is true of the profound anemia and other pathological changes in the blood which preceded and were intensified by the hematuric paroxysm. The treatment, then, should be pursued until the patient is restored to health, whether one month or twelve be required.

TO KEEP AWAY MOSQUITOES.

A resident of New Jersey writes that a mixture of one part of oil of sassafras in five parts of alcohol applied to the hands, neck, and other exposed parts, will effectually keep away the most ferocious of mosquitoes. The application should be renewed every two or three hours.

THE INTERNAL BATH IN TYPHOID FEVER.

It is interesting to note the increasing number of physicians coming forward to champion the use of water in typhoid and other febrile conditions. Recently a very interesting discussion occurred at the French Therapeutical Society with reference to the treatment of typhoid fever by so called "internal baths." We quote a portion of the discussion, as follows, from the *Medical Week*:—

"Dr. Duchenne: It is frequently a difficult matter in the country to treat typhoid fever by Brand's method. In such cases, the ingestion of large quantities of liquids, associated with copious cold water enemata, exerts a very favorable influence on the affection.

"The patient should drink from 3 to 3½ liters of liquid daily, milk or refreshing beverages, but *no broth*, in view of its toxicity.

"This treatment has been employed in Brittany with fifty-four patients suffering from typhoid fever of variable degrees of gravity.

"Deducting slight cases, there were only two deaths among thirty-seven patients.

"Dr. A Robin: Dr. Duchenne's method of treating typhoid fever confirms the views which I expressed in 1877 as to the

favorable effects of the ingestion of liquids in this disease. The principal effects of this 'drainage of the system' by means of large quantities of liquids is to carry off the toxic wastes and to favor oxidation. The patient should therefore be given as much liquid as he can take.

"Dr. Bolognesi: Juhel-Rénoy showed that cold enemata are inactive in typhoid fever, and possess neither diuretic nor antithermic properties, they being of no use except to combat the constipation. With regard to the ingestion of a large quantity of liquid, I think it must be more difficult to make a patient drink against his will than to administer baths. In my opinion, so-called 'internal baths' cannot be compared with cold baths, administered externally, as a method of treating typhoid fever."—*Modern Medicine*.

BEDBUGS AND DISEASE.

During the typhus epidemic in Odessa the disease was located mostly in dirty and crowded boarding-houses, full of vermin. Some bedbugs were put with spirochetes and starved for several days, after which the bugs were put upon the skin of a patient, under a small glass bell, during an attack of relapsing typhus. When the insects were satiated with blood they were crushed between two glass slides and examined, after slightly staining them with gentian-violet. The blood of the bugs contained many spirochetes, which retained their form after eighteen hours.

Some of the starved bugs were allowed to suck the blood upon a shaven spot on a monkey infected with typhus, then crushed, and the blood injected under the skin of a healthy monkey. Sixty-four hours later spirillæ were found in the blood of the latter. Thus among many other agents bugs may play a rôle in transferring disease.—TIKTIN, in *Meditzinskoye Obozrenye*.

TO CURE ITCH IN TWO HOURS.

Employ fresh sulphuret of calcium made as follows:—

℞ Sulphur (flour), 3 ounces.
Quicklime, 6 ounces.
Water, 2 pints.

Boil together till combined, then allow to cool and settle. Decant and preserve in hermetically sealed bottles.

Application.—Rub patient all over with soft soap for half an hour, then place in a tepid water bath for another half-hour. Next rub over with the solution and allow it to dry on the skin for a quarter of an hour. Complete by washing in the bath — HIEMINKX (Belgium).

A METHOD FOR STAINING THE MALARIAL FLAGELLATED ORGANISM.

Patrick Manson, in the *British Medical Journal* of July 10, 1897, describes the method as follows: Take thirty or forty strips (3 by 1 inches) of thick blotting-paper, each having an oblong hole (1 by $\frac{3}{4}$ inch) cut lengthways in its center; slightly moisten with water and lay in rows on a sheet of window-glass.

A patient in whose blood the crescent form of the malarial parasite abounds is selected. His finger is pricked, and a minute drop of blood, the size of a large pinhead, is expressed. A clean microscopic slip is then breathed on once, and the droplet of blood immediately taken up by lightly touching it with the center of the breathed-on surface of the slip. The blood is now rapidly and somewhat unevenly spread out with the needle so as to cover an area of about $\frac{3}{4}$ by $\frac{1}{2}$ inch. Immediately the slip is inverted over the blotting-paper cell, and pressed down sufficiently to secure thorough apposition of the slip to the paper, without at the same time bringing the blood in contact with the moistened paper forming the wall, or with the glass forming the floor of what is now a very perfect moist chamber.

The rest of the paper cells are rapidly covered with blood-charged slips prepared in the same way. In from half to three quarters of an hour the slips are removed

and dried by gently warming them over the spirit lamp with the blood surface away from the flame. When dry, the films are fixed with absolute alcohol, a few drops being poured on each. After five minutes the alcohol is dried off, and a few drops of weak acetic acid (ten to twenty per cent.) are laid on the film and left long enough thoroughly to dissolve out all the hemoglobin. The slides are then washed in water and dried. They may now be stained with various reagents. So far, I have obtained the best results from weak carbolio-fuchsin (twenty per cent.) and prolonged staining.

The stain is dropped on the slip and covered with a watch-glass; after 6 to 8 hours it is washed off, the slide dried, and a cover-glass applied with xylol balsam.

Most of the slides will show numbers of spheres and several or many well-stained flagellated bodies. Very few crescents remain untransformed. If the slips are removed and dried in from five to ten minutes after being placed on the blotting-paper cells, only crescents, ovals, and spheres will be found. If they are left for three quarters of an hour to an hour, free flagella and what Ross calls spent pigment may be found, the latter sometimes enclosed in phagocytes. Occasionally flagellated bodies are also found partially included in phagocytes.

BLUE PYOKTANIN IN THE TREATMENT OF INOPERABLE MALIGNANT GROWTHS.

In the *Journal of the American Medical Association* of June 26, 1897, Slach describes his use of pyoktanin in the treatment of tumors, and adds a word as to the technique of the treatment, which varies with the location. The injection should be made under strict aseptic and antiseptic precautions. The skin where the needle is to enter should be thoroughly cleansed with bichloride solution. The needles may be long, short, or curved, but must not be

of too small caliber, and should be boiled after using.

The author used the large hypodermic syringe and injected from one to two cubic centimeters of a two-per-cent. solution. This is more than twice as strong as recommended by Drs. Meyer and von Mosetig. The patient is given the pyoktanin pencil, one-per-cent. solution, or a two-per-cent. powder, as the case may require, to apply daily.

Thus far he has seen no untoward effects from its use. The only objection to it is that it stains everything with which it comes in contact, but what is the soiling of linen when compared with the following advantages: (1) Its analgesic effects are marked, as patients soon rest easily without the aid of morphine; (2) "the improvement of the function of the part involved"—the man who could hardly speak so as to be understood talked without difficulty after the third injection; (3) the improvement in general health which has taken place in all five of the writer's cases; (4) the element of hope that is added to the life of suffering man, brightening the remainder of his sojourn.

While he does not claim to have cured his patients, still he has relieved their pain, and rendered them less burdensome to themselves and their friends. He agrees with Dr. Meyer in von Mosetig's conclusions, "that it has been proved by practise that parenchymatous injections of inoperable malignant growths with pyoktanin can produce disappearance of malignant tissue, though in exceptional cases, and can heal neoplastic ulcerations."

Pyoktanin, when properly used, is certainly a palliative treatment for cancer that deserves an honest, hopeful trial, for by its use many have been relieved and some cured.

THE BETTER OPERATION FOR HEMORRHOIDS.

Vaux (*The Canadian Practitioner*, Dec., 1896), Resident Assistant of Mt. Sinai

Hospital, New York, describes the routine treatment in that institution as follows:—

On admission the patient is given a bath, and if hemorrhoids are strangulated an ice-bag is applied to anus; should they be merely smarting and inflamed, a wet Thiersch dressing is applied. The night preceding operation the patient is given a half-ounce of compound licorice powder, and at 5 a.m. a high enema, followed by a low one at 7 a.m.; if necessary these are repeated, the test being that the fluid comes away absolutely clear. No food is given on the day of operation. The perineum is shaved in the ward, but the scrubbing up of the patient is in the operating room. When the patient is anesthetized, the first assistant dilates the sphincter and thoroughly cleanses the rectum with soap and water, by means of a sponge and holder, and then it is irrigated; the perineum and thigh are scrubbed with soap and water, followed by ether and bichloride of mercury; wet bichloride towels are laid over the pubes and around the field of operation. Absolute antiseptic precautions are observed, the preparation of hands being the usual form for operations, and all instruments most carefully sterilized. There is not room in Mt. Sinai for the idea that the rectum is dirty, and therefore hands and instruments may be dirty too; as a consequence, sloughing or pyemia is almost unknown. A good-sized sponge with string attached is wrung out of bichloride and introduced high into the rectum, and the assistant, grasping the string, makes sufficient traction to protrude the internal piles.

The technique of the operation may be summarized under three headings:—

1. Apply the clamp in the long axis of the hemorrhoid so that the scar may be a radiating one, and thus avoid any chance of cicatricial stenosis.

2. Dip the distal end of the clamp well down, so as to include the mucous membrane of the hemorrhoid in its entire length, though only clamping off about one-

third of its substance. Be sure that no skin is included, otherwise the subsequent edema will be very great and time of recovery lengthened.

3. Sear the hemorrhoid slowly from above downward, layer by layer, the cautery being only at a dull red heat; by observing these precautions any subsequent hemorrhage is avoided.

4. Insert a tampon cannula as described below, which must not be removed till expelled by the first stool.

When the anesthesia wears off the pain will be intense, and opiates must be given. At 5 a.m. on the morning of the third day a half-ounce of magnesium sulphate is given, and at 7 a.m. an oil enema is administered through the tampon cannula; this is important, as it saves much pain when the tampon is expelled. The enema being expelled brings the cannula with it, and the first stool is comparatively painless. On each succeeding morning a half-ounce of magnesium sulphate is given, and on the fifth day the edema will have disappeared in great part, and by the eighth day the patient is ready to go. No dressing save a piece of iodoform gauze and a T-binder is used. In a ligature operation the bowels are moved on the fourth day, and in a Whitehead on the fifth.

The tampon cannula mentioned above is made by taking a piece of half-inch rubber tubing, sterilizing it, and wrapping around it several layers of iodoform gauze; it is then anointed with sterilized vaselin, and after the operation, is inserted in the rectum. The tampon cannula serves a double purpose: it allows the escape of secretions and flatus, so that all danger of retained hemorrhage is avoided; and also allows the primary enemas to be given without much pain.

In conclusion, he reviews the advantages of the clamp and cautery. It is antiseptic; not only can the clamp be readily sterilized, but the cautery itself is the most powerful germicide; there are no sloughs to separate

as in the ligature operation; there are no ligatures or sutures to offer any chance for infection; it is a radical cure; the operation is a rapid one; the time of convalescence can be definitely fixed—the eighth day. The operation, which was formerly but little employed, is now in high favor in the New York hospitals. The record of hemorrhage, pyemia, or death is almost negative. In five hundred cases operated on in Mt. Sinai, by the above method, there has not been a single death. One case of pyemia from which the patient recovered is recorded, and a few slight hemorrhages; and, so far as can be ascertained, there have been no recurrences.

INFECTION BY FLIES.

An outbreak of cholera in the gaol at Burwan is described by Surgeon Captain W. J. Buchanan, M.B., who attributes it to infection carried by flies. Although no bacteriological investigation was made, and thus no actual proof was obtained that the food had become infected in the way suggested, the circumstances of the case as detailed by him make it extremely probable that the cholera microbes were carried by flies from some infected huts outside the gaol walls to the place where the prisoners who suffered were fed. The prisoners were divided into two gangs, each of which was fed separately and had its food separately cooked. The prisoners of the batch in which the disease occurred were fed in a part of the gaol enclosure near the infected huts outside, while those in the other batch were fed at the opposite extremity of the enclosure, and it is to be noted that the wind was blowing strongly from the infected huts towards the feeding place of the gang which was attacked. It is, therefore, considered probable that swarms of flies were blown from these huts, and on reaching the trees and high gaol wall obtained shelter from the storm and settled on the food exposed in plates before the gang of

prisoners who were feeding at this corner. It is clear that we are as yet only at the fringe of this question of conveyance of infection by winged insects. The demonstration which was given last year at the Royal Society of the power possessed by flies not only of carrying bacteria about with them for considerable distances, but of retaining the infection for considerable periods of time, makes it extremely probable that these animals are the active agents in the production of many as yet inexplicable outbreaks of disease, and strongly suggests the possibility of their being the mechanism by which the aerial convection of small-pox is brought about.—*Indian Med. Gazette.*

IS THERE A URIC ACID DIATHESIS?

In spite of multitudinous researches into the nature and causation of gout and allied manifestations, so much obscurity remains, that inquirers on fresh lines are welcome, even when one is unable altogether to acquiesce in their "statement of claim." To Dr. Haig, we believe, is due the credit of having been the first to call attention to the fact that large quantities of uric acid are directly introduced with and in the ordinary food of man. This may be eliminated in the urine, failing which, oversaturation of the blood is followed by the deposition of the acid in the tissues. This is a distinct advance in our knowledge of the pathology of gout, and what may be termed uric acid manifestations; but Dr. Haig proclaims that virtually *all* the mischief-making uric acid is thus introduced, the quantities produced in the normal healthy human body being inadequate to the production of morbid symptoms. He admits, however, that uric acid may be, and indeed is, normally produced in the normal organism, in the proportion of 1 part to 33 of urea. He believes the ratio to be unalterable, but this can only be proved by prolonged observation by inde-

pendent observers. In any event, the fact that uric acid can be elaborated in the human body renders it possible, if not probable, that under particular conditions the output may be so increased as to constitute a pathological condition. We are not concerned to deny the importance of discarding any avoidable addition to the proportion of uric acid already present in a given case, but it has not yet been conclusively proved that it is impossible, even in the absence of alimentary uric acid, for sufficient quantities to be formed to give rise to a deviation from health. All animal tissues contain uric acid or substances of the xanthin group, and the alkaloids of tea, coffee, and cocoa are also xanthins, and therefore to be avoided. The ideal diet of a person who would still be currently described as suffering from the effects of the uric acid diathesis would have to be restricted to milk and cheese, bread stuffs and cereal foods and the pulses, such as peas, beans, lentils and the like. The exclusion of articles of food containing uric acid, in association with the administration of drugs which are recognized to facilitate the solution of this intractable substance, allows of the excretion of arrears of uric acid, and when the surplus has been disposed of the effects disappear. *Sublatâ causâ tollitur effectus*. There are, however, a number of facts which do not fit in with Dr. Haig's hypothesis. Stone, for instance, is very common in certain parts of India, where the natives nevertheless live exclusively on just such a diet as that recommended by him by reason of its freedom from uric acid constituents. Then, again, certain subjects, especially children continue to excrete large quantities of uric acid in spite of the most careful dieting, and in certain diseases, such as leucocythæmia for instance, the excretion is always largely in excess, whatever the diet. The first thing to

do in elaborating such a hypothesis is to obtain a general agreement as to the facts on which it is based, and sufficient time has not yet elapsed since these ideas were promulgated for this to have been accomplished in respect of the conditions under which uric acid production is modified by diet. It is quite possible, as suggested by one of the speakers during the recent discussion at the Medical Society of London, that there are two distinct conditions which have as a common factor an excessive excretion of uric acid, one in which the overproduction is the result of dietetic errors, and is consequently readily amenable to dietetic measures, and a second in which the overproduction is due to a hereditary defect in tissue metabolism, and is only modified by diet to a limited and variable extent. If this be so, the term diathesis will have to be restricted to cases coming into the second group.—*Medical Press*, December, 1896.

A SUBSTITUTE FOR COD-LIVER OIL.

Although children take cod-liver oil much more readily than adults, one occasionally encounters patients with whom it does not agree. It is of interest, therefore, to note the results of a trial made by Noorden in the Frankfort City Hospital of sesame oil, which is of a bright golden-yellow color, odorless and tasteless, or nearly so. In only one of several hundred cases was it necessary to discontinue because of vomiting and diarrhœa. Most of the children were scrofulous or suffering from debility following some one of the acute infectious diseases. In all, with the one exception, marked and rapid improvement followed. The usual dose was two or three tea- or tablespoonfuls a day, according to age, and not infrequently double this amount was given. The cost of the oil is about thirty cents a quart.—*Pædiatrics*.

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Editorial.

The past summer in America has been marked by the number of important meetings of medical and other scientific societies that convened there during this period. Judging from the large number of papers presented and the amount of discussion upon every subject affecting the physical well being and health of mankind one would expect to see that the sick rate, not to mention the death rate, of the civilized world is noticeably lessened. And this we believe will prove to be the reward of the indefatigable, unselfish labors of our medical scientists. "Medicine is not an exact science" can no longer truthfully be spoken, for while something is still left to be desired in this direction in the domain of special therapeutics and in a less degree in other departments, yet most of what the successful physician and surgeon requires to know is "exact science." No science can be said to be mathematically exact, and very much of what is now "medical" science is as exact as any other. One is impressed with this thought in perusing the papers read at these various meetings.

One of the more important of these gatherings was the adjourned meeting of the BRITISH MEDICAL ASSOCIATION, which convened at Montreal on August 31 and September 1, 2, and 3. The business meeting of this Association had been held in London on July 27, and the Montreal meeting was "for the promotion of scientific and social intercourse." This is the first time that this great Association, whose membership numbers some thirteen thousand, has met on American soil. And we are pleased to see that it was largely attended by medical men from the United States, and that such men as Osler of Baltimore and Herman M. Biggs of New York gave the important addresses on medicine and public medicine respectively. One thing especially noticed by observers from the United States was the striking similarity between the meetings of this Association and those of their

own medical congresses. There was nothing in the character or appearance of the members, the conduct of or attendance at the meetings, the value of the papers read, or the tone of the discussions to mark any difference between this and the session of the Congress of Physicians and Surgeons. And this is not because the one is patterned after the other, but it is the result of oneness of purpose, a common origin, practically identical institutions, and similarity in thought.

The Montreal meeting was opened on Tuesday, August 31, by an impressive choral service in the English cathedral at 12 m. In the afternoon the president of the council, Robert Saundby, M.D., F.R.C.P., of Birmingham, led the president of the association, Dr. Thomas G. Roddick, to the chair. Addresses of welcome were made by the mayor of Montreal, the lieutenant-governor of the Province of Quebec, the Earl of Aberdeen, and others. Dr. Roddick then delivered his presidential address. On the evening of August 31 Professor Charles Richet, official delegate from the French government, delivered an address at Laval University. The sections of medicine, surgery, public medicine, obstetrics and gynecology, pharmacology and therapeutics, pathology and bacteriology, psychology, ophthalmology, laryngology and otology, anatomy and physiology, and dermatology held meetings, which were well attended, on the mornings of September 1, 2, and 3. Subjects that commanded special attention were the dietetic treatment of diabetes, arthritis deformans, the surgical treatment of appendicitis, the choice of an anesthetic, the utility of quarantine, mandatory measures in measles, whooping-cough, tuberculosis and leprosy, hyperemesis gravidarum, vaginal *vs.* abdominal hysterectomy, treatment of insomnia and of syphilis, Widal's test, surgical gynecology in the insane, heterophoria, color perception, turbinotomy, and causation of the heart-beat. On Wednesday afternoon the address in medicine was given in Dr. Osler's inimitable style. He was spoken of on all sides as "our Osler," for he belongs to the entire English-speaking race, whether in America, Canada, or other portions of Greater Britain. On Thursday afternoon Mr. Mitchell Banks spoke on "The Surgeon of Old in War" and the foundation-stone of a new building of the Montreal General Hospital was laid by the Right Honorable Lord Lister. In the evening the annual dinner of the association was partaken of at the Windsor Hotel. The scientific business was concluded on Friday, September 3, by an address on public medicine by Dr. Herman M. Biggs, of New York City. Social gatherings were held every afternoon and evening during the entire week.

A dinner was also given by the Montreal Medico-Chirurgical Society to Lord Lister on the evening of August 31, at which time an illuminated address was presented to him in recognition of the great work done by him for the profession and humanity in the inauguration of methods of antiseptic surgery, and congratulating him on having been raised to the high distinction of a peerage.

Another important meeting was that of the NORTH AMERICAN CONFERENCE of STATE and PROVINCIAL BOARDS of HEALTH. Some of these Boards of Health are having a hard time of it in the United States in their contest with filth, ignorance, and "laissez faire"; but most of them are awake to the sanitary needs of the people, as is evidenced by the character of the subjects presented at this meeting. Among the interesting questions discussed may be mentioned the isolation of tuberculous insane; the restriction of tuberculosis by municipal ordinance; inspection of dairy cattle; the furnishing of diagnosis of contagious and infectious disease by the Boards of Health; mandatory measures in contagious and infectious diseases; embalming; vaccine farms; and the feeding of hogs on offal from slaughter-houses and cooked meat from knacker's yards. The work of these Boards is productive of much good to the states they represent, and it even touches a few in this extreme end of the world, who occasionally indulge in such things as Kansas City ham, Chicago tinned meats, or Elgin butter.

Two other meetings of far reaching importance were those of the AMERICAN ASSOCIATION for the ADVANCEMENT of SCIENCE, at Detroit, and the BRITISH ASSOCIATION at Toronto. The former, while not largely attended by the strongest men of science in America, accomplished much by its session. Not the least result to be attained by these meetings is education of the general public in scientific truths, thus doing away with quackery in general science, and concomitantly in medicine as well. It is to be regretted that our scientists do not do more in the way of general education. There is nothing upon which the world at large can be said to be more superstitious than upon the subject of science; and generally just in proportion as it approaches medical science, which means the knowledge of one's own body, how to care for it and treat its ills, this superstition becomes the more dense. And scientists could be of much aid to those who look after the public health and sanitation if they would give themselves more freely to the dissemination of scientific knowledge in a popular way.

The British Association had a much better session. A number of great names were represented at this meeting. There were Lord Lister,

the retiring President ; and his successor, Sir John Evans ; Lord Kelvin, and Michael Foster, the physiologist ; Prof. W. Ramsay, the discoverer of argon ; Sylvanus Thompson, the physicist, and the Rt. Hon. W. Bryce, the political economist. Prof. Foster's address was most timely, containing many notable utterances. He defined the position of the true scientist when he expressed the fear that at the present day many undertake a research, "not because a question is crying out to them to be answered, but in the hope that the publication of their results may win for them a lucrative post." The great progress made in the study of the conditions and aspects of life in the higher animal forms had rendered much more hopeful the study of life in its lowest and most generalized forms ; so that there is good reason to anticipate that "in the immediately near future a notable advance will be made in our grasp of the nature of that varying collection of molecular conditions, potencies, and changes, slimy hitherto to the intellectual no less than to the physical touch, which we are in the habit of denoting by the word protoplasm." Here "the animal physiologist touches hands with the botanist, and both find that under different names they are striving toward the same end."

The addresses by Sir John Evans, Prof. Miall, Prof. Marshall Ward, and others were equally interesting, instructive, and useful. Upon the whole, the meeting was of much value, not only to the scientists themselves, but to the public as well.

The last association to which we will call attention is the AMERICAN PUBLIC HEALTH ASSOCIATION, which convened near the end of October in Philadelphia. The topics discussed covered a very wide range, and we will be excused if we give the full list. They were as follows :—

The Pollution of Water Supplies ; The Disposal of Garbage and Refuse ; Animal Diseases and Animal Food ; Car Sanitation ; Steamship and Steamboat Sanitation ; The Prevention of the Spread of Yellow Fever ; The Transportation and Disposal of the Dead ; The Relation of Forestry to Public Health ; The Nomenclature of Diseases and Forms of Statistics ; The Cause and Prevention of Infectious Diseases ; Public Health Legislation ; The Cause and Prevention of Infant Mortality ; The Transportation of Diseased Tissues by Mail ; River Conservancy Boards of Supervision ; The Period during which each Contagious Disease is Transmissible, and the Length of Time for which each Patient is Dangerous to the Community ; Sanitation, with Special Reference to Drainage, Plumbing, and Ventilation of Public and Private Buildings ; Some Method of

International Arrangement for Protection against the Transmission of Infectious Diseases; Disinfectants; and Existing Sanitary Municipal Organizations of the Countries belonging to the Association, with a View to a Report upon those Most Successful in Practical Results.

Special Committees had previously been appointed on all of these subjects, and the papers presented were in the shape of reports of collective investigation of each committee upon its own topic. This plan very much enhanced the value of the papers.

It is probable that something will soon be done on the subject of terminology. The members of the Committee have been asked to meet in Shanghai, next April, and it is to be hoped that much may be accomplished at that time in the way of settling this vexed question, and definite steps be taken toward preparing a suitable vocabulary and lexicon. The different members of the committee are at work on the terms relating to the various departments of medical science, and each one will doubtless be prepared to present a useful list of terms in the department to which he has been assigned, and also to give careful consideration to those presented by others. Every member of the Committee, without doubt, desires to see this question speedily settled; and while in all probability the two parties of Radicals and Conservatives are represented in this Committee, yet we feel that the radicalism of the Radicals and the conservatism of the Conservatives is not of an extreme kind, and mutual concessions will readily be made. As a Radical-Conservative we maintain that no term already in use should be discarded without ample reason for doing so, but that no faulty nor objectionable term should be retained simply because it has already been used by translators. The best terms from a philological and etymological standpoint, and the most convenient terms to use in teaching, is what is needed.

In deciding upon terms, however, it will be necessary to fix upon a Chinese dictionary as the authority for the true meaning of a character. Giles and Williams both give terms that have been adopted by foreign translators, and do not indicate in any way that they are such, thus leading the unwary into error. A case in point is a very common anatomical term upon which the writer had some doubts; and when he came to look it up in the Chinese dictionaries, could not find it in that combination, and he is assured by Chinese scholars that it occurs nowhere in Chinese literature, and is not so used by the Chinese themselves; yet both Williams and Giles give it without a word to indicate

that it is practically a new term. A standard Chinese dictionary, like Kanghi's, should be made the ultimate authority in this direction.

The proposition of Dr. Cousland, made in his article on Medical Education in this number of the JOURNAL, to appoint an Educational Committee, meets with a hearty second from us. It had been in our mind for some months to propose the appointment of a Publication Committee to whom might be referred the questions of the publication of text-books, the publication of the JOURNAL, that of a journal in Chinese when we are ready for it, the collection of funds for these purposes, and the like. Such a Committee could also indicate what text-books and other works are needed or desirable, and could arrange for their translation or preparation. This educational committee will cover a wider field, and if rightly constituted will do much for the advancement of medical education among the Chinese.

A journal that must depend for its original articles upon a not too numerous clientele of very busy men necessarily will be subject to delays and disappointments. And this will especially be the case when articles command no honorarium. The lack of contributions to our JOURNAL is not occasioned by the lack of material for articles; for nowhere in the world has the physician a better opportunity for original investigation, the study of rare maladies, or collective work on the commoner difficulties, than here in China. The reasons that these opportunities are not more fully utilized are various. For one thing, the medical missionary is much taken up with the evangelistic side of his work, and this, on account of the lack of time for both, naturally quenches the scientific spirit. And we are not at all disposed to find fault with such persons; this is the work they have come to do. Other reasons that may be mentioned are the great amount of secular work, the management of petty details about a hospital, the time required for the training of students and helpers, the lack of suitable apparatus and room to carry on such investigation, and the like.

However, there still remains ample material to make the JOURNAL most useful and interesting to the members of our Association if we could compass some method of securing it. Those who have been our most faithful contributors are among the busiest of our missionary body. They have felt the importance of keeping up the interest of the JOURNAL and have acted accordingly. Our September number failed to appear

solely on account of the lack of sufficient original matter. And we do not feel inclined to apologise for the delay in the appearance of the present issue since this was occasioned primarily by the same condition of things, and secondarily on account of the fact that the editor has been taking over the management of one of the largest educational institutions in China, and in addition to his usual duties has been trying to keep up the duties and the class work of the retiring President for the remainder of the year.

It has been our desire to get a number of persons who would be willing to undertake the digesting of medical and surgical progress under its various departments. Eight or ten persons could do this readily, and with a very small expenditure of time, if each person took charge of some one special department. One person has not the time for it. He cannot wade through the literature of a quarter year and properly digest it for the journal in the time at his disposal. So the scissors must be brought into requisition with the result that, instead of having a broad view of medical literature for the quarter, one gets only excerpts from paragraph notices in other journals. Extensive articles and papers on important subjects must be passed over in silence. We have asked for volunteers for this work, and have specially requested certain persons to take portions of it, but as yet have come to no satisfactory arrangement.

Unless the members of the Association desire the JOURNAL to remain of its present size and are willing to come up to the help of the editorial staff in making it of interest to all, its size will be somewhat reduced, and the other portions will be kept in some definite proportion to the amount of original matter. We will endeavor to get it out on time hereafter, and its size will depend upon the amount of matter we have in hand when the time comes to go to press.

Two New York physicians, well known to nearly every possessor of a medical library in America, died within a few days of each other in June of the present year. These were J. Lewis Smith, the author of the well known *Treatise on the Diseases of Children*, and clinical professor of diseases of children in Bellevue Hospital Medical College; and William Thompson Lusk, professor of obstetrics, diseases of women, diseases of infants, and clinical midwifery in the same institution, and especially well known on account of his most excellent text-book on *The Science and Art of Midwifery*, a work that has passed through several editions, and has been translated into several European lan-

guages, and that very much needs to be translated into Chinese. Dr. Smith was born in 1827, graduated from Yale College in 1849, and took his medical degree from the College of Physicians and Surgeons, New York, in 1853; since which time he has devoted himself to the practice of medicine in New York City, giving special attention to the diseases of children. Dr. Lusk was born in 1838, entered Yale University in 1855, but did not complete his course. He studied medicine in Heidelberg and Berlin for three years, and then took his degree in medicine from Bellevue Hospital Medical College in 1864. Later he returned to Europe, prosecuting his studies in Edinburgh, Paris, Vienna, and Prague. After returning to the United States he became professor of physiology in Long Island Medical College, which position he held for four years, and was concomitantly lecturer on physiology in Harvard Medical School for one year. In 1871 he was appointed to the position in his alma mater which he held for the remainder of his life. He died suddenly of apoplexy on June 12, just three days after Dr. Smith passed away. The profession has suffered a serious loss in the death of these two men, and the world is so much the poorer by two kindly, genial, sympathetic physicians.

Miscellany.

The question of the abuse of medical charity has been largely discussed in the medical periodicals of Great Britain and America during the last few months. There is a general feeling that large numbers of well-to-do people, and even those who may be said to be in affluent circumstances, accept free treatment at the dispensaries and hospitals supported by public charity, thus filching from the really deserving poor and crowding them out of the place provided for them. In the home lands there are many who really deserve such aid, but who struggle with poverty and manage to pay their doctor bills, or get along without treatment, because their self-respect will not allow them to ask or accept charity; while on the other hand, there are those who are amply able to pay for all they get in this direction, but who seek the public dispensary on the occasion of every indisposition however insignificant. These, of course, are the extremes. But it is sad to say that the latter class is very common, and seems to be on the increase. Undeserved gratuity cannot be conferred without pauperizing its recipient. Every true man likes to feel that what he receives is his by right; and if misfortune drives him to seek charity he will only do it to relieve his present necessities. The spirit that allows a man to seek or receive unneeded charity is either the spirit of a tramp or that of an anarchist. No one can continue to do this and retain his self-respect; and just in proportion as he loses respect for himself he loses it for others and for his Maker. It is a serious question how far the indiscriminate free, or practically free, dispensing on the part of our medical missionaries aids in the propagation of the Gospel. The situation is relieved somewhat in China, as compared with England or America, by the fact that so large a per cent of the population are poor beyond ability to pay for scientific treatment, while comparatively few of the rich as yet come to our clinics or desire our treatment. But we believe that the feeling is becoming prevalent among medical missionaries that a line ought to be drawn somewhere in the matter of free dispensing, and that more should be required to pay for what they receive. Just where to draw this line is the difficult question, and how to equitably adjust the matter, or how to distinguish between the undeserving and the deserving, those able to pay and those not able. Free and indiscriminate dispensing involves the assumption of less responsibility on the part of the physician, and is in other ways the easier method. But to the patient who is able to pay it is degrading; to the unworthy patient it is valueless from a moral standpoint; it involves the expenditure of much time and considerable sums of money for which there is no adequate return; and it often crowds out the

deserving poor, or leaves so little time for the consideration of his case and its treatment that he runs the chance of failing to get relief. We have long had the feeling that a more select clinic, made up of the really deserving poor and of those well-to-do people who take enough interest in the relief of their ills to pay for it, would be more satisfactory than that made up of the present mixed lot of all sorts and conditions.

It is interesting to notice just what phases of this question have most struck those who have had this subject under consideration in Western lands. As a *résumé* of what has been said by the many writers upon this subject we reproduce the following from the *N. Y. Medical Journal* of October 23 :—

“In a paper read before the recent meeting of the New York State Medical Association, Dr. Frederick Holme Wiggin, of New York, said that his object was not so much to present individual views as to cull from recent literature, both lay and medical, the opinions of many writers. He said that it was easy to demonstrate conclusively that, as at present administered, medical charity was demoralizing to both the recipient and the donor. Some idea of the alarming growth and extent of this evil might be obtained from the carefully prepared report of Dr. Stephen Smith to the State board of charities. Here it was shown that during the year 1895, 837,971 persons applied for and received free medical treatment at 105 dispensaries in this city ; that 1,418,847 free visits were made by these applicants to these dispensaries ; and that 78,000 persons received free board, lodging, nursing, drugs, surgical dressings, and treatment—in other words, that something more than forty-nine per cent. of all who lived within our borders had professed in one year to be unable to care for themselves. This should be contrasted with another statement by Dr. Smith to the effect that during the period from 1791, when the first dispensary was established in New York, to about 1870, the applicants for charity bore a ratio to the total population of 1.5 per cent.

Dr. Wiggin then went on to quote from an editorial in the *New York Herald* to show that Greater New York spent fifty millions of dollars every year on charities, and that, according to a conservative estimate, fully fifty per cent. of the donors' money was diverted from the purpose for which it was intended, and was practically filched from the poor, to whom it rightfully belonged. Again, according to one author, Dr. J. B. Huber, one might find in large numbers at dispensaries such people as actors, opera singers, gamblers, bar-tenders, policemen, farmers from out of town, prosperous business men and those owning houses, lawyers, and perhaps even a stray railway president. According to another author, Dr. George F. Shrady, fully fifty per cent. of the applicants in the reception room of a well-known institution which he dubbed “the diamond dispensary” were well dressed ; ten per cent. were finely dressed ; more than half the men bore no evidences of poverty ; and among the women there was an attractive display of fine millinery—yet all obtained

the free treatment supposed to be given only to poor persons. A reporter on one of the daily papers, describing what he had seen at a well-known clinic, stated that not more than one in fifty was at all shabbily dressed; a large majority were fairly well dressed; one-third of them were quite presentably dressed, and perhaps one-fifth were positively well dressed. The reader of the paper said that he knew of a man who paid an enormous rent in a fashionable apartment house near Central Park, and who spent many thousand dollars a year on living expenses, yet went to what Dr. Shrady had so aptly termed "the diamond dispensary," on the plea that his expenses were so heavy that he could not afford to pay a fee to a doctor. Surely, the author continued, these instances certainly showed the spirit in which charity was asked for and accepted; it was largely a desire to save money, without apparently thinking that self-respect was lost in the effort, or that a wrong was done to the really poor and to the physician, who was certainly as much entitled to his hire as the clergyman or other members of the community, as he, too, had social obligations to fulfill. More than this, as Dr. Schweck had well said, in the *Philadelphia Press*: "People of means who go to charity dispensaries and receive treatment free of charge, representing themselves to be too poor to pay for medical services, commit a criminal act, for they obtain what they are not entitled to, and do it under false pretences."

Another and important aspect of this subject had been revealed in a communication from Dr. G. M. Roe, medical superintendent of the Boston City Hospital, to the *Boston Herald*. He said: "It is a generally accepted fact among people who have had large experience in doing charitable work that the first thing that a man or woman will accept as charity is medical attendance. They will accept free service of the doctor when you could not prevail upon them to accept rent or fuel, or anything of the kind, as a gift. The acceptance of gratuitous medical attendance is the first step toward pauperism. There is already a tendency toward what is generally known as 'nationalism,' a belief among the common people that the city and the State owe them a living, and that medical attendance, among other things, should be furnished them by common taxation, regardless of their financial standing as individuals." Again, as Dr. J. J. Stevenson had expressed it in the *Mail and Express*: "If recovery from disease is secured at the expense of self-denial, the memory of the cost will lead, in ordinary cases, to care that a recurrence of diseases and attendant expenses may be prevented. But if the careless feel that treatment, medicine, and even diet can be had simply for the asking, there can be no reason for resisting the natural tendency to neglect the laws of health. . . . It is not surprising that the reckless poor see in such careless giving an acknowledgment of the unequal distribution of wealth, and believe that it is founded on injustice; nor is it strange that the

anarchist's cry is not for opportunity to earn by labor, but for such distribution of wealth as may enable all to enjoy the luxury of idleness."

The following were the conclusions arrived at by Dr. Wiggin after a critical review of the subject: 1. That medical charity, as at present administered, is an unqualified evil, and is seriously menacing our existing social conditions. 2. That the application for free treatment of those able to pay the physician a moderate fee for his services robs the really poor. 3. That all medical charitable institutions should be under the direction and control of State and local boards of charities, which should have the power to enforce their rules. 4. That all applicants for medical charity should be investigated by local charity boards, and the unworthy excluded. 5. That no medical charitable institution should be allowed to charge nominal sums for medical or surgical service, nor should they be allowed to charge for medicines or appliances. 6. That all physicians connected with charitable institutions should be paid for the service which they render. 7. That it should be made a misdemeanor, punishable by fine, for any person to receive free medical treatment by reason of false representations as to financial condition. 8. That State or city aid should not be granted to private medical charities."

As evidence that these views are taking practical shape we just have to hand the statement that Dr. Steven Smith, who was recently elected President of the Board of Charities of New York City, is reported as having said that hereafter not one person who is able to pay for medical aid will receive free treatment at any of the city institutions.

This is an interesting and important question, and we would be pleased to see it fully discussed in its application to our medical missionary work in the columns of the JOURNAL.

At the request of the Hon. Secretary of the Society for the Suppression of the Opium Trade we gladly reprint the following:—

REMINDER TO MISSIONARIES ON FURLOUGH.

The following circular has been issued by our Committee, on the suggestion of Mr. H. J. Wilson, M.P. It is intended to send copies from time to time to British missionaries from China arriving home on furlough. From a number of missionaries now in this country we have received cordial assurances of their readiness to assist in the way suggested; some of them tell us that they are already in the habit of referring to the subject in all their addresses. We reproduce the circular here, hoping that it may thus meet the eye of some of our missionary friends in China, and may be borne in mind by them when they next visit the home country.

"A True Witness delivereth Souls."—PROV. xiv. 25.

The Society for the Suppression of the Opium Trade desires to call the attention of all missionaries from China to the opportunities which they have while in this country, and the corresponding responsibility that rests upon them, to enlighten their countrymen with regard to the Opium Trade between India and China.

A sentence or two spoken by a missionary, in the course of an Address on the work in which he is engaged, will be heard by many whom it is impossible to reach by any direct effort on the part of those engaged in the Anti-Opium Agitation. The Majority Report of the Opium Commission has thrown doubt upon our two main positions:—(1) "That the consumption of Opium is exerting a distinctly deteriorating effect upon the Chinese people, physically, socially, and morally;" * (2) "That the past history and present enormous extent of the Opium Trade with India produces . . . suspicion and dislike in the minds of the Chinese people towards foreigners," † and is thus a serious hindrance to their reception of the Gospel of our Lord and Saviour Jesus Christ. On these points the personal testimony of missionaries who have lived and laboured in China is of the utmost value. When they have failed to allude to the subject, their silence has sometimes been taken—often, no doubt, unjustly—as proof that they have no strong conviction as to the immoral and injurious character of the traffic.

We therefore earnestly appeal to all missionaries coming from China, in their Missionary Addresses whilst at home, to make a point of always bringing in at least a few words of reference to this important question, in the way of personal testimony as to what they have themselves seen of the evil effects of Opium. They will thus materially help to hasten the day for which earnest Christians have long been praying, when the fair name of our beloved country shall no longer be sullied by participation in this traffic.

On behalf of the Society for the Suppression of the Opium Trade.

JOSEPH W. PEASE, *President.*

DONALD MATHESON, *Chairman.*

MATTHEW DODSWORTH, *Treasurer.*

JOSEPH G. ALEXANDER, *Hon. Secretary.*

GEORGE A. WILSON, *Organizing Secretary.*

Finsbury House,
Blomfield Street,
London, E.C.

* Memorial presented to the Opium Commission by 17 British missionaries in China, all of at least 25 years' standing.

† Ibid.

While Dr. Tsao Yung-kwei was in England with Ambassador Chang Yin-whan, the following Address was presented to him by the Society for the Suppression of the Opium Trade. We are pleased to reprint it for the benefit of our readers from *The Friend of China*, October, 1897 :—

To DR. TSAO YUNG-KUEI,

Physician to His Excellency Chang Yin-whan, Special Envoy of

His Majesty the Emperor of China.

DEAR SIR,—The Committees of the British Societies for the Suppression of the Opium Trade welcome you as a representative of the Christian Church in China, on whom has been conferred the honour of being chosen to accompany to this country the Special Envoy deputed by your Emperor to attend the Diamond Jubilee of our beloved Queen.

We gladly take this opportunity of conveying through you to your fellow-Christians of the great Chinese nation our fraternal greetings. We rejoice that they now constitute so numerous a body, who are, in common with ourselves, “built upon the foundation of the apostles and prophets, Jesus Christ Himself being the chief corner-stone.” We pray that our Chinese brethren may be enabled so to show forth the praises of Him who has called us out of darkness into His marvellous light, that through their testimony the knowledge of His love and grace may be spread throughout that Empire, and the day hastened when China shall be won for Christ.

We are well aware that one of the greatest hindrances to the spread of Christianity in China is the Opium traffic carried on by the Government of India for the purpose of revenue. We know by the testimony of honoured missionaries, who have gone out to China from our own and other Christian lands, that the revenue thus raised is won from the misery of the Chinese people, and we deplore with you the devastation wrought in tens of thousands of homes throughout your land by the baleful habit of Opium-smoking. As British Christians, we remember with shame how in past years British merchants smuggled Opium into China, British troops made war upon China because of her honest and determined attempt to stamp out the infamous traffic, and finally British diplomatists left her no option but to admit Opium into her customs tariff, contrary to the ancient laws of the Empire and the wishes of her rulers. We regret to know that this forcing of the Opium traffic upon China has led to the extensive growth of the poppy in China itself.

We have for many years sought to enlighten our people as to these evils wrought in their name, but of which very few of them have any personal knowledge. Six years ago, to our great joy, the British Parliament was at last brought to declare the Opium traffic “morally indefensible,” and we hoped that this

would lead up to the abolition of the evil. But statesmen, unwilling to give up a lucrative revenue, under the plea that there was a difference of opinion as to the evils of Opium, persuaded Parliament to send a Royal Commission of enquiry, not to China, the country which suffers the chief injury from this evil traffic, but to India, the country which reaps all its profits, and in which the consumption is very much smaller. The Commission, when it reached India, was guided and entertained by the officials of the Government which carries on the traffic and the resources of that Government were brought to bear to minimise the testimony to the evils arising from the use of Opium. Under these influences, the majority of the Commissioners reported, as regards the use of Opium in China:—"We conclude that the habit is generally practised in moderation, and that when so practised, the injurious effects are not apparent," though they acknowledged "that when the habit is carried to excess, disastrous consequences, both moral and physical, inevitably follow." They expressed the belief that "the existing regulations" under which Opium is imported into China are "in accordance with the wishes of the Chinese Government." Their conclusion with regard to the export of Opium to China accordingly was:—"We agree in not recommending any action tending to the destruction of the trade." One of the English Commissioners, Mr. Henry J. Wilson, M.P., in a masterly report, dissented from the views of his colleagues, and pointed out "that it is altogether unworthy for a great dependency of the British Empire to be thus engaged in a traffic which produces such widespread misery and disaster." One of the two native Indian Commissioners, who supported Mr. Wilson on several important points with regard to the sale of Opium in their own country, also suggested that a communication should be made to the Chinese Government by that of the United Kingdom, offering to release them from their present treaty obligation to admit Indian Opium.

The Report presented by the majority of the Commission has puzzled many in this country.

We know, however, that our cause is that of truth and justice, and in the assurance that God is with us we are determined to go on working and praying for the cessation of this great evil. We are confident that the Christians of China will do the same.

We are,

Your brethren in the Gospel of Christ,
On behalf of the Representative Board of the Anti-Opium Societies
of the United Kingdom,

JOSEPH W. PEASE, *President.*

JOSHUA ROWNTREE, *Chairman.*

On behalf of the Society for the Suppression of the Opium Trade,

DONALD MATHESON, *Chairman.*

MATTHEW DODSWORTH, *Treasurer.*

JOSEPH G. ALEXANDER, *Hon. Secretary.*

GEORGE A. WILSON, *Organizing Secretary.*

[The names of all the members of the Executive Committee of our own Society and the Christian Union against the Opium Traffic, with those of the Anti-Opium Urgency Committee, and ten of the Women's Anti-Opium Urgency Committee, were appended.]

SIAMESE THEORY AND PRACTICE OF MEDICINE.

By E. A. STURGE, M.D.

Nature, according to the Siamese, is made up of four elements—namely, earth, fire, wind, and water.

The human body is supposed to be composed of the same elements, which they divide into two classes—visible and invisible. To the former belong everything that can be seen, as the bones, flesh, blood, etc.; to the latter, the wind and the fire.

The body is composed of twenty kinds of earth, twelve kinds of water, six kinds of wind, and four kinds of fire. The varieties of wind are as follows:—The first kind passes from the head to the feet, and the second variety from the feet to the head; the third variety resides above the diaphragm, and the fourth circulates in the arteries, forming the pulse; the fifth enters the lungs, and the sixth resides in the intestines. The four kinds of fire are—first, that which gives the body its natural temperature, the second, that which causes a higher temperature, as after exercise or in fevers; the third variety causes digestion; and the fourth causes old age. The Siamese divide the body into thirty-two parts, as the skin, heart, lungs, etc. The body is subject to ninety-six diseases, due to the disarrangement of the earth, wind, fire, and water. Thus, if there is an undue proportion of fire, we have one of the fevers. Dropsies are caused by too great a proportion of water, and the wind causes all manner of complaints. Nine out of ten of the natives, when asked what is the matter with them, answer "*Pen lom*" ("wind").

The external elements are constantly acting upon the elements making up the body, causing health or disease. Thus, in the hot season they believe we are more liable to fevers, and during the wet season too much water is absorbed, causing dropsy. Earth is supposed to produce disease by invisible and impalpable mists and vapors.

Spirits are supposed to have great power over our bodies, deranging the elements and producing all manner of diseases. The minds of the natives are thus held in continual bondage for fear of the spirits, for no one knows what great sins he may have committed in a previous state of existence for which he may be called upon to suffer at any moment. Thus the people are constantly endeavoring to propitiate the spirits by presents, incantations, etc.

In the time of Buddha lived one still worshipped as the father of medicine. To him it is said the plants all spoke, telling their names and their medical properties. These were written in books, and have become sacred. If they fail to produce the effects attributed to them, the fault is never theirs, but the want of success is due to the absence of merit in either doctor or patient. The natives use almost everything as medicine; the bone and skins of various animals occupy a large part of their pharmacopœia, while the galls of snakes, tigers, lizards, etc., are among the most valuable of their medicines. Many of the Siamese remedies are very complicated, being composed of scores of different ingredients.

The following is a characteristic prescription for the bite of a snake:—A portion of the jaw of a wild hog; a portion of the jaw of a tame hog; a portion of the jaw of a goat; a portion of goose-bone; a portion of peacock-bone; a portion of the tail of a fish; a portion of the head of a venomous snake. These, being duly compounded, form a popular remedy when the venom has caused lockjaw.

Many other native remedies are equally marvellous, but I cannot mention them. Every native physician has an image of the father of medicine in his house. The drugs are placed in this idol's hand and receive his blessing; afterward they are taken to the patient's house and boiled in earthen pots, a wickerwork star being placed below and above the drugs to give the medicines strength. The patient is usually obliged to swallow many potsful of medicine, each pot containing two or three quarts. If the patient dies, the doctor gets no fee.—*Siam and Laos.*

Book Review.

Canton Examiners' Reference Book.—A list (with descriptive notes) of goods passing through the Canton Examination Shed. Compiled by W. H. Williams, Examiner. 1892.

The above is the title of a book of 200 pages (10 in. x 9 in.) in which is given in tabular form the information required by an officer of the Imperial Maritime Customs, whose duty it is to decide questions bearing on the duty to be levied on goods passing through the Customs.

That this book is a valuable one for the purpose intended is evident when we reflect that the officers of the Customs are foreigners; and the value of the book is attested by the fact that, as soon as it was published, copies were placed by the Inspector-General in all the Custom Houses under his jurisdiction.

It is to be regretted that the compiler has received no recognition of his service or reward for his labor except that the book has been utilized as far as possible in the Customs' service. One would expect that advancement in the service or other tangible recognition would have shown that such service was appreciated. But the worthy I.-G. has not been able to see that he has taken the poor man's lamb to feast his rich mandarins.

This book has a value for medical missionaries which has only here and there been recognized, because it was little known beyond the limits of the Customs. In it will be found the names in Chinese and English of almost all Chinese medicines, with the source from which they come, their approximate value, and short descriptive notes stating in what form they are, whether seeds, or leaves, or bark, or roots, and giving also the botanical name where known. These facts form a basis on which

medical missionaries may institute investigations as to the medicinal properties and virtues of the Chinese armamentarium.

We learn from Mr. Williams' book, among many other interesting facts, that there is a very large trade in pills, which are made in Canton and exported to all parts of the empire. We notice that under the head "black pills" there are 50 different kinds. These are put up in tins or in bottles of one catty each. Of "red pills" there are seven varieties, and under the head "wax pills" there are four varieties. There are boluses, enclosed in a round covering or capsule wax, (white or yellow,) in which they are hermetically sealed, transported any distance, and kept unchanged for an indefinite time.

If other large cities produce pills in any thing like the amount made in Canton, then China cannot be deficient in a supply of medicines in this form.

J. G. K.

The Preservation of Health in the Far East.—Hints as to Clothing, Food, and Residence in China. By W. P. MEARS, M.A., M.D., late of the C. M. S., Fukien Mission, London: Church Missionary Society.

This is a parchment-covered pamphlet of 47 pages with 15 diagrams appended, illustrating house-building, well-sinking, etc. It is written especially for those resident in Mid and South China, but much of the advice given is suitable for all parts of the country.

Having recently been engaged in hospital and house building and having found many valuable hints in it, the writer of this note desires to bring it under the notice of all who may feel the need of help in similar circumstances. He can further recommend it to all who have recently arrived in China. They will find much useful information on

the best way to preserve that without which nothing can be accomplished—their health. Some of the advice is a little grandmotherly, such as the liberal use of disinfecting fluids, and that vegetables bought in the market should never be eaten, and there are some other points with which one can hardly agree, but these do not detract from the value of the pamphlet.

From experience the writer can recommend the grates described and figured. He has found them economical and warm. The only modification found necessary was to lower the height of the arched opening 6 inches to obviate the tendency to smoke. All the iron work was made locally by a blacksmith.

P. B. C.



Correspondence.

In the March No. of this Journal, 1896, I published a plea for medical statistics, and, in pursuance of the scheme proposed there, issued in December of the same year a letter to all the medical missionaries in China, inviting their help in the compilation of the statistics. To this appeal a very meagre response has been received. It would appear that many are not in the habit of keeping a case book, and where the diseases treated are noted it is not always in a shape that lends itself to tabulation. Several of these correspondents expressed the hope that they would be able in the future to send a proper list.

I write this note in the first place to thank those who sent me lists, and in the second to appeal again to all who have not yet done so to let me have statistics for this year. If they cannot compile tables of all the diseases seen, percentage statistics of the more important diseases will be very valuable. From stations in the interior any information as to the occurrence of leprosy, malaria, beriberi, rheumatic fever, rickets, chorea, granular ophthalmia, vesical calculus and elephantiasis will be most welcome.

The letter referred to is published below.

PHILIP B. COUSLAND.

DEAR DOCTOR,

If you will kindly turn to the *China Medical Missionary Journal* for March 1896, you will find there a plea for medical statistics, of the great importance of which I hope you are fully persuaded. To carry out this scheme therein proposed I am sending out this circular letter in the hope

that you will compile a list of the diseases you have met with during 1896. It should include both dispensary and hospital patients. A list of the diseases treated in hospital only would be valueless from the point of view of comparative statistics. Will you then kindly give the total number of cases treated, and a table of the different diseases with their percentage, e.g., 3000 patients treated, dyspepsia 300 or 10 %. In the skin diseases it will be as well to state whose system of classification you follow, and with regard to general terminology it would be a great advantage if the standard nomenclature drawn up by the Royal College of Physicians could be adhered to. The occurrence of any epidemic should be noted. It is especially important that the diseases given below should be recorded. Specific febrile diseases from small-pox to dysentery, erysipelas, leprosy, malaria in all its manifestations, beriberi, venereal diseases, rheumatic fever, true chronic rheumatism, osteo-arthritis, tubercle, rickets, chorea, insanity, alcoholism, suicides (opium), granular ophthalmia and entropion, cataract, cardiac, valvular affections, phthisis, vesical calculus, elephantiasis, goitre, diabetes mellitus, malformations. Rare cases especially should be noted. I trust you will be able to send me as full a list as possible. If time or circumstances prevent you sending a complete list, I hope you will be able to report on the diseases mentioned above.

Yours sincerely,

PHILIP B. COUSLAND.

Chao-chow-fu, Swatow, 2nd Dec., 1896.

Notes and Items.

A CORRECTION.—In the article on Myopia, translated by Dr. Jellison for our June number, on page 106, 3rd line, instead of "Example: for an M 20 D will $U_{20} = \frac{20}{2} = 20$ D" it should read "Example: for an M 20 D will $U_{20} = 10 + \frac{20}{2} = 20$ D." The 20 beside the U is an exponent, and the 10, which is in all the formulæ, was omitted.

The editor frequently receives letters addressed to him as editor, but not intended for publication, which contain items and suggestions of so great value that we feel tempted to publish them just as they are written; of course we might utilize much of this material in making up paragraphs without indicating the source of our information, and this we sometimes do. But in other instances it is impossible to use some of the most valuable suggestions, on account of the necessity of eliminating the personal element, unless we should promulgate these thoughts as primarily emanating from our own brain, which would scarcely be honest. So with an apology to our correspondents for the liberty we take, we proceed to give a few extracts that we think will be of value and interest.

Our senior medical missionary in writing of the March number of the JOURNAL says: "The President's address and your editorials are to the point, and if the younger members of the profession do not come up to the mark they will be much to blame. It is evident that as our literary work develops it increases on our hands many fold. Literary and professional activity at home is pressing on us here, and with our pressing duties here in our special work, the medical missionary in China of the present day cannot take things leisurely. He must work, work, work; and with system and mutual consultation a vast amount of work can be done.

Uniformity in terms is the first matter of supreme importance; and when a dictionary of terms is completed, the way will be much easier and shorter for those who then take up the work."

Another member of the Association writes: "It is especially gratifying to see such an article as von Tunzelman's in the JOURNAL. I could wish we might see more such, showing original work done by members of the Association, or by Port physicians in China. I do not think the JOURNAL has been particularly strong in lines of original work, and it seems as though in such a wide field as China we ought to be able to make studies, which would be fitted to instruct the world. I freely confess, however, it is easier to talk than to act.

"I like the idea of reviewing hospital reports as received by the JOURNAL so as not to delay acknowledgment, but at the same time I thought the plan adopted last year of lumping the reports and giving a list of hospitals and their attendances, together with copious notes showing progress, was an excellent one, which might supplement the notices of individual reports from time to time by giving a summary toward the end of the year of all reports received. Indeed I think it ought to be considered the duty of each one of us to send at least a numerical report to the editor of the JOURNAL at the end of each calendar year, so that once a year the JOURNAL might give a reliable total of medical work done in the mission hospitals of China during the preceding year."

Dr. Davenport, in a letter enclosing photographs of Mackay's tomb, which came to hand after our June number had gone to press, in speaking of the stone having been erected by the wife of the Governor of Hupeh, says: "Since the erection of this stone there has been a more precious witness. Recently, in the public worship, on a Sabbath morning, at the hands of

Mr. Kristensen, this lady was admitted a member of the Church, receiving Christian baptism. The present good feeling shown by the Governor toward us and our work, so different from his bearing only a few years ago, appears to be largely due to the free entrance Mackay won in the official circles and the influence of his character in their midst. He has not lived to see these fruits,—they follow him. May not we encourage ourselves in the work, feeling that we sow with the right hand and with the left, and may see little result, yet the promise still stands, 'that we cannot labor in vain in the Lord.'

Dr. Porter writes the following from P'ang-chuang, showing very welcome progress in medical educational work. We hope the plans have gone on to consummation. "At our annual Mission Meeting the question of more continuous work in the line of medical instruction came up. It was decided to open up the way for the College graduates to study medicine by adding a Medical Department to the college and by the appointment of Dr. A. P. Peck to be Dean of the Medical Faculty. A committee was appointed to consider a medical course and to decide upon which of our mission hospitals should be considered the most suitable place for carrying on a course of study. These plans are still in an undeveloped state."

Attention of all of the members of the Association is called to the resolution offered by Dr. Cousland in this number of the JOURNAL, in reference to admitting to membership in our Association the medical missionaries and other medical men of the Far East outside of China. This is in line with our suggestion in a former number of the JOURNAL. Of course the extension of the privilege of membership to these countries involves a change in the name of the Association and in the title of the JOURNAL. We feel that this move

will greatly strengthen our Association and will give us a strong bond of union between all of the medical men of the Far East, and in particular will bring the medical missionaries of these ends of the earth nearer together. We hope that the members will send in their votes to the Secretary early, so that the decision of the question may not be long delayed.

The following hospital reports have been received since our last review, but for lack of time extended notice of them must be delayed until the March number:—Twenty-fifth Annual Report of the Po-na-sang Hospital, Foochow; Report of the Hospital and Dispensary at Teng-chow-fu; Eleventh Annual Report of Hao-meng-fêng Hospital, Ningpo; Report of the Peking Hospital, London Missionary Society; A. B. C. F. M. Hospital for Women and Children, Foochow; Report of Medical Work in connection with P'ang-chuang Station; Fifth Annual Report of the General Hospital of the M. E. Church, Chungking; Report of the London Mission Leper Asylum at Hiao-kan.

In response to the following doleful complaint the officers of the Association have decided to print the amended Constitution and Bye-Laws in the present issue of the JOURNAL. The brother must not, however, take too much credit to himself, as there was some thought of publishing these documents before his letter was received. The share that he may rightfully claim for himself in the matter is in having somewhat hastened the publication and in having assisted thus in making it an accomplished fact:—

DEAR MR. EDITOR: Would it not be well, for the sake of those who have never had the opportunity of seeing the Constitution and Rules of the Medical Missionary Association of China, that they should be printed in the pages of the JOURNAL? I see we are expected to send in our votes on some proposed

alterations in the Constitution, but how can we do so if we have never seen it? Another thing I notice is that with nearly every issue of the JOURNAL Voting Papers are issued, and we are asked to look up MED. MISS. JOURNAL, September, 1890, pages 210, 227. I suppose for instructions how to vote. Now I suppose that more than half of the membership of the Association has been admitted since that date, and I suppose that very few of them have the back numbers of the JOURNAL, so that the voting is really a matter of form confined to a few. I have now been a member for 5 or 6 years, I am afraid a very useless one, and I don't think I have ever yet signed a voting paper. How officers are elected and the affairs of the Association are managed I do not know. I am not complaining that this is the fault of any other person than myself, as I suppose if I had wanted to know all I had to do was to write and enquire. I think, however, I am in the same position as many others who are members, and whose membership consists only in getting the JOURNAL and reading it. Of the other privileges of membership we practically know nothing, except that we have the privilege of contributing to the pages of the JOURNAL. In view of what

our President says in his address about a *broader representation*, I would propose that the Constitution and Rules of the Society be printed, so that all of the members might have a copy, and intending members might know something about the Society we ask them to join."

Extra copies of the Constitution will be sent to each of the officers of the Association for distribution. Members or others desiring copies can secure the same by applying to any one of these officers.

We are requested to call attention to the following little sheet tract, which is intended for free distribution to dispensary patients. The author of the tract says: "Let all who wish to do so have the proper characters inserted, advertising each his work and print as many copies as are needed. The cost at the Presbyterian Mission Press is nine dollars for ten thousand, about ten for one cent. Patients who come to the daily clinics are generally so much interested in their bodies that they need to have the importance of their souls pressed upon their attention. The object of this sheet tract is to present the leading facts as to the soul in the simplest and briefest form."

論 畧 魂 靈

一人惟有一靈魂並無三魂六魄
畜生無靈魂人死亦不能投畜生
人生在世惟有一回死後不能復投他人
天父靈爲人靈魂之根本
至人死時靈魂立刻或升天堂或入地獄
靈魂得救之法獨一無二
人悔改而信耶穌獨依靠之此乃真救法也
耶穌必救誠心依賴之人
耶穌要人得救故願死於十字架替人贖罪
耶穌要萬國得救其救法萬國通行
世上末日耶穌將降世使萬民復活
末日萬民復活各人靈魂仍歸各人身體
末日各人靈魂與身體同歸耶穌審判
人得盡天下榮華富貴勿如靈魂得救
人生前信耶穌復活審判之後必得永無疾病之身○禱告文求天父
因耶穌在十字架所立之功勞赦免我罪孽
使我靈魂同身體在天堂永遠享福

THE FOUNDER OF THE RED CROSS IN A POOR-HOUSE.

J. Henry Dunant, the real founder of the Red Cross society, and the organizer of the famous convention of Geneva, was born in Geneva, May 8th, 1828. The horrors which he witnessed in the campaign of Napoleon III against the Austrians in Italy, in 1859, led him to write a pamphlet upon the subject, which horrified the civilized world with the terrible cruelties of war, especially the account of the suffering of the wounded through neglect. A few years later, in 1863, he traveled at his own expense from capital to capital through the countries of Europe, and finally succeeded in organizing the conference in Geneva in October, 1864, which resulted in the permanent organization of the Red Cross society.

M. Dunant spent the greater portion of his fortune in developing this splendid charity, and, a few years later, lost the balance of it. He has since been obliged to live as an object of charity in a poor-house. It is to the credit of the empress of Russia that she has recently provided for his comfort and maintenance. Like many other philanthropists, M. Dunant does not find the compensation for his philanthropic labors in this world. It is unfortunate indeed that society is so little appreciative of the sacrificing efforts of such men as to deny them even proper recognition.

MARRIAGES.

At the Cathedral, Shanghai, on the 11th of October, 1897, by the Rev. H. C. Hodges, M.A., ARTHUR DAVIES PEILL, M.B., C.M., (Edinburgh), of the London Mission, Chi-chou, North China, to ALICE MURIEL McFARLANE, daughter of John McFarlane, Esq., J.P., Glenbourne, Edinburgh.

At the British Consulate, Chefoo, 21st Oct., Dr. J. NORMAN CASE, of Wei-hai-wei, to Miss E. RUTH FARWIG, of Lao-ho-k'ou.

BIRTHS.

At Jin-jow, N. Kin-chow, Manchuria, on the 15th July, the wife of T. L. BRANDER, M.B., C.M., of a daughter.

At Ta-ku-tang, on July 23rd, the wife of Dr. J. A. ANDERSON, of a son.

At Soochow, on the 5th of August, the wife of J. B. FEARN, M.D., of a daughter.

At Brooklyn, N. Y., on the 11th Oct., the wife of Rev. GEO. A. HUNTLEY, M.D., A. B. M. U., Han-yang, of a daughter.

At Li-man, Shansi, Oct. 18th, the wife of Dr. W. L. HALL, of a daughter (Dorothea).

At Wuhu, Oct. 22nd, the wife of Dr. E. H. HART, Am. Meth. Epis. Mission, of a son.

At Hongkong, on 27th Nov., 1897, the wife of Rev. C. R. HAGER, M.D., American Board Mission, of a son.

DEATH.

At Kuan-cheng-tse, on the 5th July, of dysentery, ANNIE GILLESPIE, L.R.C.P., S.E., of the I. P. Mission, Manchuria.

ARRIVALS.

At Shanghai, 27th Sept., O. T. LOGAN, M.D., (not located).

At Shanghai, 2nd October, Dr. MARY L. BURNHAM, and Dr. and Mrs. W. MILLAR WILSON, (returned).

At Shanghai, 18th October, Dr. H. N. KINNEAR, Foochow, (returned).

At Shanghai, 24th October, Dr. IDA AIKEN, for Manchuria.

At Shanghai, 21st November, Dr. W. WILSON, for C. I. M.

At Shanghai, 26th November, Dr. MARY A. AYER and Dr. FRANCES F. CATTELL, for Soochow.

DEPARTURES.

From Shanghai, July 24th, Dr. and Mrs. WILLIAMS, C. I. M., for England.

From Shanghai, 22nd November, Dr. C. F. JOHNSON, for U. S.

Official Notices.



Miss D. M. M. MACKLIN, M.D., *Toronto, has been duly elected a member of the Medical Missionary Association of China.*

CONSTITUTION AND BY-LAWS

OF THE

MEDICAL MISSIONARY ASSOCIATION OF CHINA.

CONSTITUTION.

ARTICLE I.

This Association shall be called the MEDICAL MISSIONARY ASSOCIATION OF CHINA.

ARTICLE II.

The objects of the Association shall be—

First.—The promotion of the Science of Medicine amongst the Chinese, and mutual assistance derived from the varied experiences of Medical Missionaries in this country.

Second.—The cultivation and advancement of Mission Work and of the Science of Medicine in general.

Third.—The promotion of the character, interest, and honor of the fraternity by maintaining a union and harmony of the regular Profession in this country.

ARTICLE III.

The Members shall be graduates of a recognized regular medical college, with proper testimonials from the Missionary Society under whose auspices they are laboring. They shall be proposed by one Member of the Association and elected by a majority of those voting. They shall be considered Members when they shall have signed or sent in their names to be added to the Constitution, thereby agreeing to be bound by its provisions.

Persons of every nationality shall be eligible for membership.

ARTICLE IV.

There shall be three classes of members: *First.*—Active Members, who shall be those engaged in Medical Missionary work in China; *Second.*—Honorary Members, those engaged in private practice in China, not being connected with any Missionary Board. Honorary Members are not entitled to vote; *Third.*—Corresponding Members, who shall be composed of all Non-Resident Medical Missionaries throughout the world, and of such others as may be duly elected by the votes of the Association. Corresponding Members shall not be entitled to vote.

ARTICLE V.

The Officers of the Association shall consist of a President, a Vice-President, a Secretary, a Treasurer, an Editor and a Curator of the Museum, all of whom shall be elected biennially by a majority of the Members voting. No Member shall be eligible to the office of President for two successive terms. These officers shall have the power to elect executive committees from their own body, or from other active members of the Association, to fill up any vacancies (caused by death or otherwise) in the executive of the Association, and to take initiative action in all matters affecting the welfare of the Association.

ARTICLE VI.

A copy of these Rules, together with the By-Laws made from time to time, shall be printed, and shall be binding upon every Member of the Society.

Each Member shall be provided with a copy of the Rules and By-laws free of charge.

BY-LAWS.

ARTICLE I.

Meetings.—The stated meetings shall be held at the call of the President of this Association.

ARTICLE II.

The President, or in his absence the Vice-President, shall preside at the meetings, and enforce the rules of order, appoint all committees not otherwise provided for, give the casting vote in case of a tie, and perform such duties as his position requires. In the absence of both President and Vice-President the meeting shall elect its own Chairman.

ARTICLE III.

The Secretary shall keep the minutes, notify absentees of their appointment, furnish the Chairman of each Committee which may be appointed with the list of its members, receive the signatures to the Constitution, notify in writing new members of their election, keep a roll of all three classes of members, publish a revised list annually in the Journal, and conduct such correspondence as may from time to time be necessary.

ARTICLE IV.

The Treasurer shall receive and have charge of all the moneys of the Association and pay all bills approved by the same. He shall report the condition of the Treasury to the Association on the 30th day of June, and the 31st day of December, of each year.

ARTICLE V.

Members preparing papers, or proposing to exhibit cases to the Association, shall notify the other Members of the subject they propose for discussion, at least two months before the next regular meeting of the whole Association. As the Association will only meet, as a body, once in several years, most of the discussions will be conducted through the columns of the Medical Journal of the Association.

ARTICLE VI.

All motions shall be presented with the signature of the proposer, either directly to the Association or through its Journal.

ARTICLE VII.

Each President on retiring shall become an Honorary Vice-President of the Society for life.

ARTICLE VIII.

The initiation fee required from all Active Members shall be one dollar. There shall be no fee from Honorary Members. Yearly dues shall be two dollars, in advance.

ARTICLE IX.

The following shall be the order of business for each meeting, in the transaction of which ordinary parliamentary rules shall be enforced :—

- I. Calling the Roll of Members.
- II. Reading of the Minutes of last Meeting
- III. Report of Committee on Admissions.
- IV. Election of New Members.
- V. Propositions for Membership.
- VI. Report of Committees and Officers.
- VII. Written Communications and Discussions thereon.
- VIII. Verbal Communications.
- IX. Unfinished Business.
- X. New Business.
- XI. Adjournment.

ARTICLE X.

In the event of any important subject coming up calling for the immediate action of the Association, the President and Secretary can issue circulars calling for the votes of the Members on the question at issue. The result of this vote when counted by the President and Secretary and announced to the Members of the Society, to be binding upon all Members of the Association. The President and Secretary can use the columns of the Medical Journal in lieu of a circular when they may deem it best so to do.

ARTICLE XI.

These By-laws may be altered or amended by a three-fourths vote at a regular meeting, provided notice of the same shall have been given in writing two months previously.



